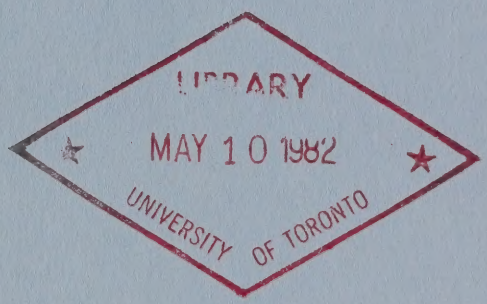
NATIONAL ENERGY BOARD
REASONS FOR DECISION

In the Matter of an Application under
the National Energy Board Act

of



The New Brunswick Electric Power Commission

March 1982

NATIONAL ENERGY BOARD

REASONS FOR DECISION

In the Matter of the Application Under
the National Energy Board Act

of

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION

March 1982

Ce rapport est publié
séparément dans les
deux langues officielles

NATIONAL ENERGY BOARD

IN THE MATTER OF an application by New Brunswick Power Commission for orders and licences to export power under Part VI of the National Energy Board Act.

(File 1923-N7/4-9)

HEARD AT FREDERICTON, New Brunswick on 24, 25, 26, 27, and 30 November and 1 and 2 December 1981.

BEFORE:

R.F. Brooks	)	Presiding Member
J.R. Hardie	)	Member
J.L. Trudel	)	Member

APPEARANCES:

W. Davidson P. Creaghan I. Blue	)))	New Brunswick Electric Power Commission
H. Williamson	)	Atlantic Provinces Economic Council
J. Barrows	)	Herself
G. Edwards M. Goldberg E. May	)))	Canadian Coalition for Nuclear Responsibility
G.R. Cluney L.R. Douglas	))	Canadian Manufacturers' Association
N. Aspin J. Foster	))	Canadian Nuclear Association
F.H.P. Dewdney	)	Cominco Limited
A. Secord	))	Conservation Council of New Brunswick
G.E. Daly	)	Himself
G.C. Brown A. Johnston S. Raj	)))	Electrical and Electronic Manufacturers Association of Canada
J. Barkhouse	)	Electrical League of New Brunswick

J. Brown	)	Fredericton Branch of the Maritime Energy Coalition
R. Frenette D. Hoyt R. McCrae	)))	Liberal Party of New Brunswick
T. H. Good J. Wilson	))	New Brunswick New Democratic Party
J.J. Donahue	)	The Power Commission of the City of Saint John
R.M. Bell	)	The Rocca Group Limited
K. Bedell	)	Voice of Women, Fredericton Branch
P.A. MacNutt	)	Province of New Brunswick
A. Bigué	)	Attorney General for Province of Quebec
T. Richardson	)	Town of Summerside
S. Fraser L. Smith	))	National Energy Board

TABLE OF CONTENTS

LIST OF APPENDICIES

ABBREVIATIONS USED IN THE REPORT

Units of Measurement

kV	-	kilovolt
kW	-	kilowatt
MW	-	megawatt (1 000 kW)
kW.h	-	kilowatthour
GW.h	-	gigawatthour (1 000 000 kW.h)

Names

AECL	-	Atomic Energy of Canada Limited
Applicant) NBEPC) NB Power)	-	The New Brunswick Electric Power Commission
BEC	-	Boston Edison Company
Board) NEB)	-	National Energy Board
CCNR	-	Canadian Coalition for Nuclear Responsibility
CNA	-	Canadian Nuclear Association
Coalition	-	Maritime Energy Coalition
Council	-	Conservation Council of New Brunswick
d.c.	-	direct current
EEMAC	-	Electrical and Electronic Manufacturers Association of Canada
EMEC	-	Eastern Maine Electric Cooperative Inc.
Lepreau	-	Point Lepreau CANDU unit No. 1
MEPCO	-	Maine Electric Power Company Inc.
MMWEC	-	Massachusetts Municipal Wholesale Electric Company
MPS	-	Maine Public Service Company
Maritime Electric)	-	(Maritime Electric Company, Limited
MEC)	-	(Maritime Electric (PEI), Limited
NDP	-	New Brunswick New Democratic Party
NEB Act	-	National Energy Board Act

CHAPTER 1
BACKGROUND

THE APPLICANT

The New Brunswick Electric Power Commission is a crown corporation in the right of the Province of New Brunswick. It was established as an electric power utility in 1920 by the legislature of the Province.

NB Power owns and operates a power system which extends throughout New Brunswick. Appendix 1 is a map showing the most important components of this system and its interconnections with adjacent utilities. Appendix 2 is a map showing the location of NB Power relative to its major market areas in Canada and the United States.

When the Point Lepreau CANDU station is placed in service the system will include 14 generating stations with a generating capacity exceeding 3,000 MW as listed in Appendix 3. The generation is predominantly thermal. Six hydroelectric stations, all located on the Saint John River watershed, provide about 25 percent of generating capacity, but a lesser percentage of total energy generation because of widely fluctuating flows in the river.

In the north, NB Power is interconnected with Hydro-Quebec and in the southeast with Nova Scotia Power Corporation. A tie has recently been completed with Maritime Electric Company, Limited on Prince Edward Island via submarine cables.

The ties with the United States on the west border of the province consist of a 345 kV line to Maine Electric Power Company Inc., and several 138 kV and 69 kV lines to Maine Public Service Company and Eastern Maine Electric Cooperative Inc.

Under licences from the National Energy Board, NB Power has been exporting power to MEPCO over the Keswick-Orrington line since 1970. The current licences EL-64 and EL-65 came into effect

in 1976 and expire on 31 October 1986.(1) Exports to MPS commenced in 1956 and to EMEC in 1958; the current licences are EL-66 which was issued in 1972 and expires on 31 October 1986(1), and EL-108, 109, 110, 111 and 112 which commenced in 1978 and expire on 31 October 1982.(2)

THE PRESENT APPLICATION

The electrical exports with which this report deals are of various types. Some represent a continuation of NB Power's international sales and cross-border accommodations which have become an electrical way of life between New Brunswick and New England. Parts 1, 2, 3 and 4 of the current NB Power application attracted the most interest in that they seek authorizations to export portions of the capacity of Point Lepreau, Atlantic Canada's first nuclear generating unit.

Conceived more than a decade ago, the idea of a nuclear generating unit in the Maritimes was attractive from several standpoints. The unit's output would replace up to six million barrels of oil annually by reducing generation from oil-fired stations using fuel made from imported crude oil. Lepreau would be the first large nuclear generating unit in the nation outside Ontario and its installation would be good for the CANDU industry. But there were reasons for hesitation too. The smallest available commercial size of the CANDU unit, 630 MW, was very large relative to the size of the NB Power system. It represented almost half of the NB Power domestic load expected for the period when the unit would come into service. It is not reasonable or acceptable from both operational and economic standpoints to have generating unit sizes larger than a certain limiting percentage of a system's load; the exact ratio for a given system is a matter of knowledge and experience gained over many decades by power system planners, but is seldom more than 10 to 15 percent.

---

(1) See NEB Report to the Governor in Council on the application of NBEPC, July 1972.

(2) See NEB Report to the Governor in Council on the application of NBEPC, December 1977.

The idea of a nuclear unit for New Brunswick was nonetheless kept alive by a plan which would see the effective size of the unit reduced to 400 MW by utilizing about a third of the nuclear installation's capacity to produce steam for a heavy water plant to be located nearby. That plan did not come to fruition. In its place came another proposal, this one seeming to be particularly attractive in that the Lepreau unit would become, in effect, a Maritime power source owned and operated by a new entity, the Maritime Energy Corporation, through which the three Maritime Provinces would share the costs and output. The size of Lepreau would be more reasonable in relation to the combined load of the several provincial systems. But this plan too failed to become reality.

Adding to NB Power's troubles in the late seventies, the rate of load growth, which had averaged seven percent or more per year for so long that such increases were taken for granted, began to slow down. Also, the costs of Lepreau, an inherently capital intensive project, were spiralling upwards as inflationary pressures increased. Over about ten years there has been a four-fold increase in the capital cost; the gross capital investment is now about $1.2 billion. NB Power's concern over the prospect of having to bear the full cost of Lepreau increased. While units comparable to the Lepreau unit had operated well at Pickering most of the time, there had been problems necessitating lengthy shutdowns for repairs. These could be accepted by Ontario Hydro because it had the necessary financial capability and generating capacity reserves. However, parallel events at Lepreau would have proportionally much larger effect on the smaller NB Power system.

The in-service date now planned for Lepreau is several years later than the date anticipated when the unit was orginially committed. This delay, while slightly reducing the problem of excess capacity, has greatly increased the problem of escalating costs.

Against this background, NB Power turned to utilities in New England to find "partners" who would buy portions of the output of Lepreau under contracts known as unit participation agreements.* Negotiations were pursued for several years, seemingly with some difficulty because rates of growth of electricity demand in New England were diminishing. The New England utilities did not require the firm capacity which unit participation agreements could provide but they were still interested in purchasing energy which would displace oil-fired generation. The best prices that NB Power could negotiate therefore had to be competitive with least cost alternative energy prices with no charge for capacity. At one time NB Power appeared to be on the verge of signing up participants to take 335 MW of output, but some potential sales fell through and NB Power came to the Board's public hearing in November of last year with 205 MW covered by signed contracts.

The introduction on a power system of a new unit much larger than existing units always carries with it costs which are in a sense abnormal, and the magnitude of the additional costs depends on how much larger the new unit is. The amount of reserve capacity carried on the system has to increase as a function of the size of the new largest unit to assure that the loss of that unit would not result in inability to meet customer load requirements. The largest units on the NB Power system, and for that matter on the Maritime system, are the 330 MW units at Coleson Cove, but the effective size of those units was held at a lower level during the early years of their service through a participation export approved by the Board in 1972 similar in principle to the current Lepreau export plan.

The decision facing the Board in this application was whether or not the export proposal of the Applicant, which had taken several years of difficult negotiation with New England

---

* A unit participation agreement entitles the purchaser to a share in the output of the specified generating unit under terms and conditions defined in the agreement. The purchaser is obligated to pay for its entitlement whether or not the power is generated and delivered.

utilities and which would reduce the effective size of the Lepreau unit to a more reasonable limit, was in the public interest given the particular circumstances in which NB Power finds itself.

The Applicant asked the Board to accept NB Power's judgment that it had properly assessed the cost of not using all of the Lepreau output for Canadian load on the one hand versus the financial exposure or risk of NB Power having to carry the entire cost of the $1.2 billion Lepreau station on its own, the latter being all the more difficult if the unit had to be shut down for a prolonged period during the early years.

CHAPTER 2
THE APPLICATION

In an application dated 19 November 1980, as amended 16 June 1981, 29 July 1981, 13 November 1981 and during the public hearing in Fredericton, NB Power applied for ten licences to export electric power and energy as listed below. The various agreements under which these exports would be made are summarized in Appendix 8.

Part 1 To export a maximum of 100 MW of firm power and up to 876 GW.h of firm energy in any consecutive twelve-month period to Massachusetts Municipal Wholesale Electric Company for the period 1 November 1981 to 31 October 1990, in accordance with the Point Lepreau Unit Participation Agreement.

Part 2 To export a maximum of 100 MW of firm power and up to 876 GW.h of firm energy in any consecutive twelve-month period to Boston Edison Company for the period 1 November 1981 to 31 October 1995 in accordance with the Point Lepreau Unit Participation Agreement.

Part 3 To export a maximum of 130 MW of firm power and up to 1 138 GW.h of firm energy in any consecutive twelve-month period for the period beginning 1 November 1981 and ending 31 October 1995 from Point Lepreau to a party or parties and under terms and conditions to be approved by the Board.

Part 4* To export a maximum of 15 MW of firm power and 92 GW.h of firm energy in any consecutive twelve-month period to EMEC for the period 1 November 1981 to 31 October 1990 of which 5 MW would be in accordance with the Point Lepreau Unit Participation Agreement and the balance in accordance with the Capacity Agreement.

* For clarity of presentation "Part 4(a)" is defined as the Point Lepreau participation portion and "Part 4(b)" as the system portion of Part 4 throughout the report.

Part 5 An amendment to licence EL-65 to export 6 482.4 GW.h of interruptible energy less firm energy exported under the existing licence EL-64 and under Parts 1, 2 and 3 above in any consecutive twelve-month period from 1 November 1981 to 31 October 1990.

Part 6 An amendment to licence EL-66 to permit a carrier transfer not exceeding 140 MW and energy not exceeding 1 226 GW.h in any consecutive twelve-month period from 1 November 1981 to 31 October 1990.

Part 7 To permit an extension of the term of licence EL-108 for the export of short-term power and energy to MPS from 1 November 1982 to 31 October 1990.

Part 8 To permit an extension of the term of licence EL-109 for the export of interruptible energy to MPS from 1 November 1982 to 31 October 1990.

Part 9 To permit an extension of the term of licence EL-110 for the export of firm power as a carrier transfer to MPS from 1 November 1982 to 31 October 1990.

Part 10 To permit an extension of the term of licence EL-112 for the export of interruptible energy to EMEC from 1 November 1982 to 31 October 1990.

Revocation

To revoke Licence EL-111 which expires 31 October 1982, conditional upon Part 4 of the application being granted.

CHAPTER 3
THE EVIDENCE: THE EXPORT OF POWER AND ENERGY

ELECTRICITY DEMAND FORECAST

The Applicant submitted its latest forecast of demand on the NB Power system as summarized in Appendices 4 and 5. The forecast is based on a recent survey of residential, commercial and industrial requirements to the year 1995.

The resulting forecast is for NB Power's firm peak demand in Canada to grow from 1 710 MW in January 1983 to 2 426 MW in January 1995. Its annual energy demand in Canada would rise from 9 523 GW.h in 1983 to 13 054 GW.h in 1995. These figures represent a growth rate of about 3.7 percent per year in peak demand and 3.5 percent per year for energy.

The firm demand in Canada includes sales to MEC of Prince Edward Island which has purchased a ten percent ownership in the coal/oil-fired Dalhousie No. 2 generating unit. MEC will therefore be entitled to its share of the output of Dalhousie, about 20 MW, for the life of the station, about 30 years. In addition, it has purchased an entitlement to transmission wheeling for the same period.

CAPACITY, ENERGY SUPPLY, RESERVE AND SURPLUS

A summary of the generating capacity available on the NB Power system appears in Appendix 3. At present, the total nameplate capacity is 2 539 MW. When the Lepreau nuclear unit No. 1 is placed in service, planned for 1 April 1982, the nameplate capacity of the system will rise by 630 MW to 3 169 MW. No further additions to generating capacity are planned for the period ending in 1995.

A summary of the NB Power system capacity, estimated demand, reserves and surplus for years 1980-95 is shown in Appendix 4.

The corresponding energy supply, load, reserve and surplus under dependable stream flow conditions is displayed in Appendix 5.

Additional energy would be available under median hydraulic conditions as indicated in Appendix 6, and still more energy would be available in years with high stream flows as indicated in Appendix 7.

The reserve requirement was calculated by the Applicant based on the NB Power share of the largest unit in the Maritime region. The resulting requirement ranged from 111 MW in 1981 to a maximum of 234 MW in 1991.

After providing for maximum estimated firm loads under dependable flow conditions, a surplus of at least 416 MW and 4 689 GW.h would remain in any year.

Additional energy may be available from the hydroelectric resources of Hydro-Quebec when it has a surplus. This energy is not included in the supplies listed in Appendices 5, 6 and 7 because it is interruptible and its delivery is not assured. Large amounts of energy were obtained from Hydro-Quebec in 1980 which supplied over 40 percent of in-province loads plus direct exports by NB Power plus energy wheeled through New Brunswick by NB Power and sold for Hydro-Quebec.

This energy is transmitted from Quebec to New Brunswick via a 320 MW direct current back-to-back interconnection at Eel River. A second d.c. interconnection is under consideration.

A witness for NB Power stated that the utility expected to be able to purchase large quantities of energy from Hydro-Quebec in future, that these supplies were an important consideration in NB Power's plans, and that this energy would continue to be used in New Brunswick to the full extent of its availability.

At expected capacity factors, the entire energy output of the 630 MW Lepreau unit is equivalent to about 6 million barrels of oil per year. A witness for NB Power stated that about 250,000 to 1,500,000 barrels per year of oil would be burned to replace part

of the proposed 335 MW of Lepreau participation export with the balance of the export replaced by hydroelectric energy from Hydro-Quebec.

The Applicant stated that all the power and energy proposed for export is surplus to Canadian requirements.

FUEL SUPPLY

The evidence showed that the energy proposed for export would be generated at the Applicant's hydraulic stations or thermal generating stations fueled with coal, oil or uranium. Also, NB Power would export hydroelectric energy supplied by Hydro-Quebec.

A witness for the Applicant stated that there is sufficient coal available from mining operations in New Brunswick to support about 1 000 GW.h of generation annually in New Brunswick. Additional sources of coal would be required if Coleson Cove were converted to coal-firing. This coal might be obtained from the United States. With New Brunswick or United States coal considerable environmental protection equipment would be required to meet environmental air quality regulations. Alternatively, low sulphur coal might be obtained from Western Canada in which case environmental limitations could be met more easily although the coal would be more costly because of the transportation costs.

Heavy oil used in the Applicant's system originates from off-shore suppliers. Supplies are plentiful and no interruption of supply is anticipated. A witness for the Applicant stated that no special plans had been made to resolve any problems which might arise as a result of future possible disruption to oil supply.

NB Power provided estimates of fuel prices and federal government oil compensation payments for the period 1981-1995.

REASONS FOR POINT LEPREAU UNIT PARTICIPATION SALES

The decision to proceed with construction of the 630 MW Point Lepreau CANDU station was made in June 1974 following analyses made by NB Power which showed that nuclear power would be the economic choice for future generation. It was originally expected that the equivalent of 200 MW of the station output would be used in the form of steam for heavy water production at an adjacent plant and 400 MW of electric generation would be required to meet the demands on the NB Power system. By the late 1970's the heavy water project had been cancelled and the growth rate of electricity demand in the province was slowing. NB Power anticipated it would have a surplus of generating capacity, but considered it would be necessary to retain the existing fossil-fired generation in service to provide capacity when Lepreau was not in operation.

NB Power was concerned with the magnitude of its financial risk if it retained all of the capacity of the Lepreau unit in its own system. The utility would have to pay all the costs of the nuclear unit and, if Lepreau should experience significant outages, there would be additional major expenditures to pay for fuel or purchased energy to replace the unavailable output of Lepreau. To reduce this financial risk exposure, the utility sought customers who would purchase some of the output of Lepreau on a participation basis until about 1990 when in-province demands are expected to absorb much of this surplus power.

Sales on a unit participation basis would also effectively reduce the size of the 630 MW unit on the NB Power system, which would result in improved operating flexibility and lower reserve requirements.

NB Power sought to supply Lepreau power to Canadian utilities which would have been members of the proposed Maritime Energy Corporation. When it became evident that Lepreau would be placed in service before the Maritime Energy Corporation could be

established, NB Power held direct discussions with neighbouring Canadian utilities but, in the end, no arrangements were made to sell firm output from Lepreau in Canada.

By 1980 NB Power felt that the optimum balance of financial and operating considerations would be achieved if it could arrange to export 335 MW of Lepreau on a unit participation basis. Discussions were held with various utilities in New England. The sale of 100 MW to MMWEC, 100 MW to BEC and 5 MW to EMEC was negotiated as set out in Parts 1, 2 and 4(a) of this application. The utility also proposed, as Part 3 of the application, to export 130 MW on a similar participation basis to one or more New England utilities, if negotiations could be concluded at some future date.

A witness for the Applicant stated that these export sales would have a beneficial effect upon Canada's balance of trade.

EXPORT MARKETS

NB Power described the area which affected its business as including those customers within a 550 mile radius as shown on the map in Appendix 2. The principal export markets are in New England extending south to Boston.

Witnesses for MMWEC, BEC and EMEC testified that their principal reason for purchasing power from Canada was to displace oil-fired energy generation on their systems. EMEC has an additional incentive because it has limited interconnections available to it and requires supply from New Brunswick. .

Alternative sources of supply for MMWEC include participation in various fossil-fired and nuclear stations. MMWEC has joint ownership in the Seabrook nuclear station and the utility expects to have access to a considerable quantity of power at about 5.5 U.S. cents/kW.h commencing in 1985-87.

Alternative supplies for BEC include the Pilgrim 1 nuclear generating unit. The previously proposed Pilgrim 2 has been cancelled.

Whereas the cost of Lepreau participation power to the United States customers would be marginally attractive in 1982, savings are expected to increase markedly by 1990 because the price of oil is forecast to increase rapidly whereas the cost of participation in Lepreau would be steady or would decline with depreciation of the station.

The witness for MMWEC estimated the alternative oil generation energy costs to his utility in 1982 at about 5.9-7.3 U.S. cents/kW.h, including 0.2 cents transmission costs in the United States, rising to 8.3-10.3 cents by 1986. The witness for BEC estimated alternative oil generation energy costs at 5.0 U.S. cents including 0.4 cents transmission, in 1982, rising to 12.7 cents in 1990. The witness for EMEC estimated alternative costs at 5.5-7.0 U.S. cents, including 0.3 cents transmission, in the early years of the contract and double that amount in the later years.

POINT LEPREAU UNIT PARTICIPATION AGREEMENTS

General

A witness for the Applicant testified that the unit participation contracts with the American utilities had been settled following negotiations between the parties. NB Power feels it has negotiated good contracts representing the best terms and conditions that the market would bear. The final arrangements represent a balance between NB Power's desire to reduce its financial risk in Lepreau at least cost to the utility and the United States utilities desire to displace oil in their systems.

Terms and Conditions

The terms and conditions of these agreements and a summary of the pricing formulae are provided in Appendix 8. The estimated bill resulting from the agreements is shown in Appendix 9.

Part 3 of the Application

At the time of the public hearing the Applicant had not completed negotiations with possible purchasers of blocks of firm power which would be exported under Part 3 of the application. Testimony was given that these contracts would be similar to the contracts with MMWEC, BEC and EMEC. In the event different clauses were negotiated with future customers, MMWEC, BEC and EMEC would have the right to revise their agreements with NB Power to incorporate these new clauses.

Price

The evidence provided by the Applicant, summarized in Appendix 9, was that the total revenues to be received for Lepreau power in April 1982 would amount to about 6.2 Cdn. cents/kW.h if the unit were to operate at 75 percent capacity factor during that month. The revenues to be received subsequently would probably diminish as accumulated depreciation reduces the payments on account of capital costs, offset somewhat by the escalation of the heavy water, fuel and operations and maintenance charges.

Witnesses for MMWEC, BEC and EMEC testified that the price to be paid by them for Lepreau participation power would depend upon the final cost of the station, dollar exchange rates, capacity factor and other considerations. Initial expected prices were for MMWEC about 5.8 Cdn. cents/kW.h at 80 percent capacity factor, for BEC 5.7-6.9 Cdn. cents/kW.h including wheeling to Boston and for EMEC 6.3-6.5 Cdn. cents/kW.h including charges for transmission and losses.

JUSTIFICATION OF EXPORTS

Lepreau Participation Exports - Parts 1, 2, 3 and 4(a)

Testimony was given that the nuclear firm power and energy which would be exported under Parts 1, 2, 3, and 4(a) would not be sold with the objective of financial profit but to reduce the financial loss that would result if Lepreau performed poorly in the first years of its operation.

The financial exposure, or risk, perceived by the Applicant is the incremental expense to NB Power of supplying energy to Canadian customers from alternative sources if Lepreau does not function at 75 percent capacity factor. The cost of reducing NB Power's financial risk is the incremental cost of replacing the exported portion of Lepreau's output by other sources when Lepreau is operating at the planned capacity factor.

The Applicant presented evidence, included as Appendix 10, to show that under certain assumptions of supply from Hydro-Quebec and NB Power system operation, the cost to NB Power of making 335 MW of participation exports would range from a saving of $54.4 million in the first year to a cost of $57.1 million in the eighth year.

The reduction of risk resulting from 335 MW of exports would rise from $56.8 million for a one-year outage in the first year to $110.5 million for a one-year outage in the eighth year.

The above figures were calculated using estimated compensated oil prices. The amount of compensation was estimated to rise from $5.4 million in the first year to $16.5 million in the eighth year based on certain assumptions regarding system operations. If Coleson Cove were converted to coal-firing and a second d.c. link were constructed with Hydro-Quebec, the amount of oil compensation payments was forecast to be to $0.3 million in the fifth year, and to be $1.8 million in the eighth year.

The Applicant stated that the whole analysis included as Appendix 10 was expressed in Canadian dollars as of April 1982 using a deflator of ten percent.

Witnesses for the Applicant testified that the pricing of Lepreau participation power exports as defined in the contracts with MMWEC, BEC and EMEC would result in the recovery of the corresponding portions of substantially all the costs to the utility according to its accounting policies. These include recovery of the direct costs on account of capital, heavy water,

fuel and operations and maintenance. In addition, the pricing formulae would give NB Power revenues slightly in excess of its specified direct costs so that there would be a contribution to the equity of the utility.

BEC would also pay a bonus on supply over 80 percent capacity factor in return for being granted the right to extend its agreement to 1995 under certain conditions and a right of first refusal of 100 MW if a second nuclear unit were constructed at Lepreau.

Under cross-examination, evidence was given that NB Power would not charge for wheeling of power over the 345 kV transmission line from Lepreau to the international border for exports to MMWEC and BEC. A witness for the utility stated that this line provides adequate capacity, that there would be no additions or changes made to the transmission system on account of these exports, and therefore the utility would not incur any additional cost for this transaction. New transmission facilities built to connect the Lepreau generating station and the existing 345 kV transmission system were stated to be required to meet Canadian system demands and no additional costs would be incurred on account of the exports. Power losses incurred in wheeling from Lepreau to the international border would be paid for by the purchasers.

In response to a direction by the Board, Exhibit 82 was compiled and submitted by the Applicant. It showed that if a transmission charge for wheeling from Lepreau to the border for MMWEC and BEC were calculated on the same basis as the wheeling charge from Dalhousie to Maritime Electric (PEI) Ltd., the charge would be $8.65 per kW year.

Under its agreement with EMEC, NB Power would charge for wheeling over a 69 kV line running from Lepreau to the international border because some changes may be required in this circuit. Power losses incurred in wheeling from Lepreau to the international border would be supplied by EMEC.

Justification of Other Proposed Exports

All the other proposed exports under Parts 4(b) to 10 would be made for direct benefit to NB Power. Testimony was given that export transfers in the last year resulted in a net benefit to NB Power of about $36 million compared with in-province revenues of about $318 million.

Part 4 of the Application

Under Part 4(b) of the application, up to 15 MW of system firm power would be exported to EMEC. This power would be supplied at capacity factors estimated to be 13 percent and higher. The capacity charge of $30,000 per MW year with some escalation was compared with the charge for supplying power from peaking gas turbine units.

The energy charge would be set by an Operating Committee at not less than 110 percent of incremental cost. The present rate is 72 mills per kW.h.

When Lepreau is placed in service, up to 5 MW would be supplied to EMEC from Lepreau under Part 4(a) and the balance of the requirements of Part 4 would be supplied under Part 4(b) described above.

Interruptible Energy Exports - Part 5 of the Application

Under Part 5 of the application, the Applicant applied to extend its licence EL-65 to export in any twelve-month period up to 6 482.4 GW.h of interruptible energy less firm exports made on the 345 kV line under Parts 1, 2 and 3 and licence EL-64. The quantity limit was selected to be equal to the export capacity of the transmission system, which is now some 740 MW. Energy prices would be on a split-saving basis or at 80 percent of United States decremental cost. When NB Power wheels power for export for Hydro-Quebec, NB Power receives a payment equivalent to 15 percent of the saving to the United States utility plus $3 per MW year for wheeling. When interruptible energy is purchased from Hydro-Quebec, the price to NB Power is 80 percent of NB Power's decremental cost.

Evidence was given that under certain conditions of system operation and streamflow the full amount of 6 482.4 GW.h could be surplus available for export.

Carrier Transfer for MEPCO - Part 6 of the Application

The Applicant sought to have its existing licence EL-66, under which firm power is wheeled for MEPCO to various United States utilities, extended to 31 October 1990. The firm power carrier transfer quantities would be increased to 140 MW and 1 226.4 GW.h in any twelve-month period.

Parts 7, 8, 9, and 10 of the Application

Evidence was given in respect of Parts 7, 8, 9 and 10 of the application that no changes were contemplated in the circumstances of these proposed exports relative to the situations which exist under licences EL-108, EL-109, EL-110 and EL-112. Each Part seeks the extension of an existing licence to 31 October 1990.

Part 7 Licence EL-108 has not been used to date but extension was sought to permit NB Power to meet potential demands of the MPS system.

Part 8 Licence EL-109 authorizes the export of 300 GW.h per year of interruptible energy to MPS.

Part 9 Licence EL-110 permits a carrier transfer of up to 50 MW through the MPS system to Edmundston, New Brunswick. This transfer provides assistance to NB Power in supplying the Edmundston area.

Part 10 Licence EL-112 permits the export of 179 GW.h of interruptible energy to EMEC in any twelve-month period.

Revocation of Licence EL-111

Conditional upon Part 4 being granted, NB Power would no longer require its short-term firm licence EL-111 and its revocation was requested.

ENVIRONMENTAL EFFECT OF EXPORTS

The Applicant stated that all its operations would be conducted so that environmental impacts would be within applicable federal and provincial regulations.

Copies of an "Environmental Assessment for the Point Lepreau Generating Station, March 1977" were provided with the application. The Applicant stated that Lepreau would be operated at its maximum permitted rating whether or not exports were made. Therefore, there would not be any incremental nuclear-related environmental effects on account of exports.

There would be additional fossil fuel burnt in New Brunswick as a result of exports of participation nuclear power. Fossil fuel would also be burnt on many occasions due to other exports from the system. Copies of "Environmental Impact of Thermal Power Generation, Spring 1981" were supplied with the application. This document estimated the incremental environmental impact which would result from exports made under several scenarios. In all cases the environmental impacts were considerably below levels allowed by regulation.

Air quality is monitored in accordance with provincial regulations at each station.

SOCIAL COSTS

A witness for the Applicant stated that the environmental impacts external to NB Power would be far below levels permitted by applicable regulations. Therefore, NB Power would ascribe zero social cost to all of its operations including the proposed exports.

LONG TERM WASTE MANAGEMENT AND STATION DECOMMISSIONING

A witness for the Applicant stated that, subsequent to the execution of the agreements with MMWEC, BEC and EMEC, NB Power had decided to levy an operating charge of 1.0 mills/kW.h on all its customers for Lepreau power in respect of long term management and storage of nuclear waste materials.

Similarly, a capital charge of 0.4 mills/kW.h would be levied in respect of eventual Lepreau station decommissioning.

SALES TO CANADIAN UTILITIES

Testimony was given that the Applicant had negotiated with Canadian utilities to try to sell them firm power from Lepreau. An agreement had been arranged to sell Lepreau participation power to MEC but this agreement was subsequently cancelled. A witness for the Applicant stated that the blocks of firm power proposed for export under Parts 1, 2, 3 and 4(a) of the application had been offered to Hydro-Quebec, MEC and Nova Scotia Power Commission. The Applicant stated that none of these parties had expressed interest in purchasing any of the power.

The unit participation agreement for the sale of 100 MW to BEC includes a clause which would permit NB Power to repurchase the entitlement by mutual agreement.

A witness for the Applicant stated that blocks of firm power which would be exported under Parts 3 and 7 would be offered to Canadian utilities prior to seeking Board approval for the commitment of these negotiated export contracts. Exports under Parts 5, 8 and 10 would be interrupted at any time if required by a Canadian purchaser.

A witness for the Applicant stated that NB Power had recently changed its policy with regard to the pricing of sales to Canadian utilities. Power would be offered for sale on terms equivalent to the prices to be charged for export. Reduced pricing for Canadian purchases would not be included in future contracts because NB Power would seek to sell in the market which would yield the highest return. Maritime Electric and Nova Scotia Power Corporation had been informed of the new policy.

CHAPTER 4
SUBMISSIONS AND INTERVENTIONS

Written submissions relative to the application were received from approximately 25 individuals and organizations, of which 18 appeared at the hearing.

Among the topics addressed by those who wrote to the Board but who did not present their submission at the hearing were expressions of support for the granting of the application on the grounds of economic benefit and improved system operations, and expressions of opposition coupled with concern about the environmental impact of nuclear power.

A letter was received from the Leader of the Liberal Party of Prince Edward Island seeking assurance that 30 to 40 MW of Lepreau power would be available to Prince Edward Island. An official of the Town of Summerside, Prince Edward Island, wrote a letter to the Board asking that 3.8 MW of Lepreau power be held available for the Town of Summerside.

A resumé of each intervention presented at the public hearing follows.

Atlantic Provinces Economic Council

The Atlantic Provinces Economic Council supported the application of N.B. Power. In a submission, it stated that the export of power represents an important income opportunity for the Province of New Brunswick while ensuring that the province will have, under its control, a stable supply of energy for its own future economic development.

Mrs. J. Barrows

Mrs. Barrows, a citizen of the State of Maine, opposed the application of NB Power on several grounds. Financial instability of some purchasers could cause increased costs for all purchasers, operating problems at Lepreau could result in high costs for the purchasers, some purchasers have not demonstrated a need for the power and a major accident at Lepreau could cause serious personal, environmental and economic harm. Nuclear power

was stated to be a less reliable source of electricity than renewable decentralized energy sources which represent a preferable investment.

Canadian Coalition for Nuclear Responsibility

The CCNR opposed the application of NB Power to export power and energy from Lepreau.

In its submission, the CCNR referred to aspects of nuclear reactor design, modes of forced outage and possible consequences of various failures. The CCNR stated that radiation protection standards are inadequate, that the magnitude of risk of a serious accident has been underestimated and that off-site liability insurance is inadequate.

The witness also pointed out that the addition of Lepreau to the system will increase the average cost of power because of the high cost of the new generating unit.

In argument, the CCNR agreed that a surplus had been demonstrated. This conclusion arose from the position of the CCNR that the Lepreau plant need not have been built in the first place.

This intervenor focussed on the question of price in an effort to demonstrate that the price proposed to be charged for the unit participation exports was not just and reasonable in relation to the public interest.

With respect to the Board's first price test*, the CCNR stated in argument that it adopted the views presented by the Conservation Council of New Brunswick in respect of the inability of the proposed participation exports to meet the first price test. In addition, it was stated that the nuclear exports would fail to meet the first price test because they would fail to recover the following costs incurred in Canada: costs associated with the increased burning of oil, large subsidies to the Canadian nuclear industry, interest forgiveness to NB Power, costs of transmission in New Brunswick to United States utilities, the costs of long-term waste disposal and decommissioning of the reactor, costs associated

* Refer to pages 36 and 37 for a description of NEB price tests.

with the possibility of shortening the lifetime of the plant, the environmental monitoring costs, costs of the emergency measures organization and other agencies, costs arising out of the billing procedures proposed to be used and costs of expensive equipment replacement which could occur in the lifetime of the plant and the lifetime of the contracts.

The CCNR stated that the evidence presented by NB Power in respect of the environmental effects of nuclear generation and social costs related to those effects was inadequate and it presented a motion to require the Applicant to provide additional information. This request was denied by the Board. The CCNR stated that NB Power should be required to include social costs in export prices and that, in estimating these costs, NB Power should conduct its own studies and not rely on studies made by other utilities in other areas of the country.

The CCNR also submitted that the second price test would not be met under the proposed unit participation agreements in that the price for Lepreau power towards the end of the contract term would be less than the price for oil fired generation for New Brunswick consumers. As well, this intervenor submitted that the third price test would not be met.

In summary, the CCNR concluded that the application was not in the best interest of Canada and that proposed exports of Lepreau participation power should not be allowed because the Board's three price tests could not be met and because the evidence presented on environmental aspects of nuclear generation and the social cost associated therewith was inadequate.

Canadian Manufacturers' Association

The Canadian Manufacturers Association stated that the industry's single most important priority for Canada's national energy policy is to have adequate and secure sources of energy in the right forms at the right time and place and at internationally

competitive prices. The association supported the application of NB Power on the grounds that the proposed exports would assist in attaining the above-stated objectives.

Canadian Nuclear Association

In its submission, the CNA discussed the role of the Canadian nuclear industry in meeting Canada's energy needs.

A witness for the CNA stated that the Lepreau station is constructed to the CANDU design in a fashion similar to the nuclear stations of Ontario Hydro and that similar excellent performance is anticipated.

When questioned as to how Canada would recover the costs of nuclear research and development undertaken over the past several years unless some charge was applied to exported power, a witness for the CNA stated that the investment would be recovered over the long term by an improvement in the total Canadian economy as a result of nuclear industry activity.

The CNA was asked why United States utilities would seek to buy nuclear power from Canada in preference to constructing their own nuclear units. The witness replied that some United States customers wished to purchase blocks of electric power smaller than could be obtained by installing their own nuclear units, given the minimum size of such units now commercially available.

Cominco Limited

In its submission, Cominco Limited supported the application of NB Power.

Conservation Council of New Brunswick

The Council opposed the application of NB Power to export power and energy from Lepreau. Two areas of concern expressed by this intervenor were that the proposed nuclear export price was not just and reasonable in relation to the public interest and that the evidence submitted by the Applicant with respect to the environmental impact of the nuclear export was deficient.

With respect to the question of price, the Council focussed on the Board's first price test which states that the export price should recover its appropriate share of costs incurred in Canada. This intervenor identified some costs which it defined as costs incurred in Canada and which would not be included in the proposed export price.

While witnesses for NB Power stated that the Applicant did not plan to charge for wheeling service from Lepreau for MMWEC and BEC, the Council stated that the wheeling used transmission facilities in Canada resulting in costs which should be included in the price of participation exports.

The Council referred to evidence, which was provided to the Board, to show that interest payments on a $350 million loan from Atomic Energy of Canada Ltd. to NB Power amounting to some $102 million would be forgiven and would not be included in the Lepreau gross capital investment. The Council argued that this was a cost incurred in Canada in making Lepreau participation exports, which should be recovered from the United States purchasers. A witness for the Applicant stated that this interest was forgiven as an offset to costs incurred in replacing defective equipment and should not be regarded as a cost of making the export.

Other costs which would be incurred in Canada and which should, in the Council's view, be recovered in the export price included increased federal government oil compensation payments resulting from the export of the 335 MW of power, adequate provision under the unit participation agreements for full recovery of waste disposal and unit decommissioning costs and costs associated with the general development of nuclear technology in Canada.

The Council also submitted that certain of the clauses in the unit participation agreements were not in the public interest. In particular, the Council objected to the non-discrimination clause in the unit participation agreements on the basis that it

might limit the federal government's ability to charge an export tax on electricity in the future or that it might result in NB Power imposing a similar tax on its own customers. This intervenor also objected to the granting of Part 3 of the application because, under the terms of the unit participation agreements, NB Power would be required to offer to purchasers under Parts 1 and 2 of the application any different clauses and conditions which were subsequently offered under Part 3. The Council submitted that since the Part 1 and Part 2 unit participation agreements could be substantially changed up until the time that any contract was signed under Part 3 of the application, the application under Parts 1 and 2 lacked substance.

The Council also expressed some concern about a clause in the unit participation agreement with BEC which would appear to put a limit of $8 million per year on the liability of BEC for Lepreau capital replacement items. It was stated that this could result in NB Power being unable to recover the cost of a major replacement because of the limit on annual payments by the United States customers and because the payments would cease, in any event, upon expiry of the contract.

The Council also noted that the billing procedures in the unit participation agreements differ from the billing procedures in in the agreement between MEC and NB Power with respect to the Dalhousie unit. In the Dalhousie agreement, MEC would be billed for power and energy on the 15th day of each month during which those costs were incurred, whereas the United States participants in Lepreau would be billed following the end of each month during which the costs were incurred. The Council estimated that this would result in a cost reduction to the United States purchasers of approximately $300,000 per year, or about $3 million over the life of the contract, relative to the price paid by Canadian purchasers.

In summary, the Council submitted that the application to export power from Lepreau should not be approved because it is not in the public interest.

Mr. E. Daly

Mr. Daly opposed the granting of licences to export firm participation power from Lepreau. He stated that, when Lepreau is placed in-service, the ratepayers in New Brunswick should gain the full benefits of Lepreau operation. If Lepreau does not work well enough to cause the participation contracts to commence, there would be no revenue from United States utilities. After Lepreau is placed in-service at over 500 MW output so that revenues from the United States begin to flow, Lepreau is unlikely to experience prolonged outages.

He stated that a dangerous precedent would be established if NB Power were permitted to export power at no profit.

Mr. Daly questioned the wisdom of entering into agreements, such as the Lepreau unit participation agreements, in which, he stated, the benefit to NB Power would be deferred. He thought NB Power should have sought immediate benefit from exports.

Electrical and Electronic Manufacturers Association of Canada

EEMAC stated that in 1980 Canada's power exports earned $800 million, contributing substantially to the Canadian balance of trade and energy. The proposed participation exports would bring in revenues of $130 million per year which would amount to 50 percent of the annual carrying charges of the $1.2 billion capital invested in Lepreau.

EEMAC endorsed the export proposed by NB Power as being technically correct, economically right, in the best interests of the province and a trend setter for the rest of the country.

Electrical League of New Brunswick

The Electrical League of New Brunswick supported the application of NB Power.

Fredericton Branch of the Maritime Energy Coalition

In its submission, the Coalition stated that it is opposed to nuclear power developments in the Maritime Provinces.

The Coalition stated that the granting of licences to NB Power to export electricity would accelerate development of nuclear power plants although there are many serious unsolved problems associated with the technology. Development of nuclear power for export would result in environmental risks to New Brunswick. The prices which would be charged for the export of power would not recover the total social and economic costs of the generation.

Electrical exports would encourage further capital investment in nuclear power station construction, which provides few permanent jobs but precludes the adoption of other energy options.

Two reports were introduced in evidence by the Coalition and it was argued that these studies suggest that serious environmental damage may well occur as a result of Lepreau operations.

Liberal Party of New Brunswick

Mr. Frenette, representing the Liberal Party of New Brunswick, submitted that NB Power should have sought other ways of reducing its financial exposure because of Lepreau before arranging export agreements. For example, the Federal Government might have purchased power on an all-events basis.

The witness for the Liberal Party stated that New Brunswick had not been eligible for federal government off-oil subsidies in the years when about 60 percent of its power generation was from oil. When it was recognized that the Lepreau station could reduce oil-fired generation to about 27 percent of the provincial total, New Brunswick was included in the off-oil program. The spokesman sought assurance that these grants would not be discontinued because of the resultant increase in the percentage of oil generation if the Board were to approve the export application.

Mr. Frenette submitted that Atlantic Canada had been given various federal grants and incentives to assist in getting "off-oil". These grants included assistance with Point Lepreau.

It would appear that approval of the nuclear participation export licences would be contrary to the objectives of the National Energy Program. Mr. Frenette asked the Board to explore all alternative avenues for the disposal of surplus power from Lepreau before approving the nuclear exports.

New Brunswick New Democratic Party

The NDP stated that it opposed the export of Lepreau power. After examining the costs which would be imposed on Canada in order for NB Power to reduce its financial risk at Lepreau, the NDP concluded that the cost to Canadians under the contracts proposed by NB Power and the United States utilities would be too high. Mr. Good, representing the NDP, was not satisfied that the benefits of the proposed Lepreau participation exports would exceed the costs and he presented evidence to demonstrate the kinds of probabilities which would be necessary in order to approximately equate the benefits which might be derived from the reduction in financial exposure as compared with the costs that would be incurred.

The NDP also pointed out that the contracts should cover the full costs to Canadians.

This intervenor stated that it was opposed to any export licences being granted for the Point Lepreau plant until NB Power submitted a proper environmental impact study of the proposed exports and until the safety of the reactor was established by an independent assessment subject to public scrutiny.

The NDP also expressed concern about the precedent-setting nature of this application and urged the Board to reject nuclear exports as a general policy.

Power Commission of the City of Saint John, New Brunswick

The Power Commission of the City of Saint John stated in its submission that it supported the export application of NB Power. The Power Commission stated that approval of the proposed exports would enhance the reliability of electric power supply to Saint John, would improve the stability of rates and would be consistent with Canada's off-oil program.

Rocca Group

The Rocca Group supported the application of NB Power. Granting of the export licences would result in economic benefits for the province and would perhaps lead to the early commitment of Lepreau 2 which the Group would like to construct.

The Voice of Women, Fredericton Branch

A witness for the Voice of Women stated that the organization is opposed to nuclear power on the grounds that it exposes people to radiation hazards and encourages the production of nuclear weapons. Additional objections were voiced on political grounds.

Province of New Brunswick

Counsel for the Province spoke in support of the application. He stated that it is desirable to utilize generating capabilities and existing interconnections with neighbouring utilities to secure maximum benefits for the citizens of New Brunswick in respect of electricity supply and price.

The Attorney General for the Province of Quebec

The Attorney General for the Province of Quebec expressed no opposition to the application of NB Power.

CHAPTER 5
DISPOSITION

Section 83 of the National Energy Board Act ("NEB Act") sets forth considerations applicable to the issue of export licences. Three of these are: that the Board shall satisfy itself that the power to be exported is surplus to reasonably foreseeable Canadian requirements; that the Board shall satisfy itself that the price to be charged for the exported power is just and reasonable in relation to the public interest; and that the Board, in dealing with the export application, shall have regard to all considerations that appear to it to be relevant.

In arriving at its disposition, the Board has relied upon the information supplied with the application dated 19 November 1980 and subsequent amendments, submissions from intervenors and evidence adduced and argument presented at the public hearing.

SURPLUS

The Applicant provided information regarding the expected supply, demand, reserve and surplus forecasts for the proposed terms of the licences. For numerical evidence with respect to the NB Power system the Board has relied principally upon the latest information submitted as Exhibit 72 - Revised Tables Amendment II.

The evidence showed that under dependable flow conditions about 10 percent of the firm demand on the NB Power system in the period 1982-1995 can be supplied from in-province hydroelectric resources and some minor purchases with the remaining 90 percent from thermal-generation resources.

The dependable supply of power in New Brunswick relies upon the continued availability of offshore oil supplies. Some offshore oil would continue to be required after Lepreau is placed in service, even if the entire Lepreau output were retained for use in Canada.

In 1980/81 NB Power was able to obtain over 40 percent of its total in-province energy requirements from Hydro-Quebec and also exported some energy obtained from Hydro-Quebec. This energy

from Hydro-Quebec is supplied on an interruptible basis and there are no contracts to ensure its future availability. However, the Applicant stated that it is expected Hydro-Quebec will continue to supply energy to New Brunswick in increasing quantities and consideration is being given to the construction of an additional interconnection between the provinces which would increase the transfer capability to some 800 MW.

Two letters were received in which the Board was asked to reserve Lepreau power to the extent of 30 to 50 MW for Prince Edward Island and 3.8 MW for the Town of Summerside. The regulation of the supply of power to these parties is beyond the jurisdiction of the Board. However, the evidence showed that the MEC has arranged to purchase an entitlement in NB Power's Dalhousie unit #2 replacing an earlier agreement to purchase Lepreau output. The Board received no submission from MEC in respect of future purchases of Lepreau. The Board would expect that the Town of Summerside would be supplied by MEC, but in the event some different arrangement were negotiated, 3.8 MW of power is less than one percent of the system capacity of NB Power and could be supplied by the Applicant without significantly affecting its surplus.

In its final estimates NB Power used a method of required reserve calculation based upon its participation in the largest unit on the interconnected system. This had the effect of reducing the reserve to about 10 percent of system firm demand from the previous appropriation of about 20 percent. Regardless of the method of calculation of reserve, the evidence showed that after meeting firm demands in Canada there would be sufficient surplus to meet the proposed firm exports.

The Board is satisfied that the power and energy proposed for export under all Parts of the application is surplus to reasonably forseeable Canadian requirements.

ENVIRONMENTAL IMPACT AND SOCIAL COSTS OF EXPORTS

Several intervenors addressed the subject of environmental impact resulting from the operations of NB Power and ascribed social costs to the operation of nuclear and fossil

fuelled generating stations. No evidence was adduced by the intervenors to show the quantity of environmental impact or the dollar amount of social costs said to be caused by the operations of NB Power, or the incremental amount of such costs which would be incurred by the proposed exports. A witness for NB Power stated that operations are conducted within the limits of applicable regulations and, since there would be no environmental impacts beyond those permitted under the regulations, the utility would assign a zero value to social costs. The Applicant stated also that the Lepreau unit would at all times be operated at full permitted rating whether or not exports were being made.

The Board accepts the evidence that Lepreau would be operated at full capacity whether or not export loads are to be supplied and finds, therefore, that the proposed export would not result in incremental environmental impacts or social costs applicable to nuclear generation. There would be some incremental environmental impact and social cost resulting from fossil fuel generation both for export and for the replacement of Lepreau exports. However, the Board is satisfied that these incremental costs would be small relative to the values of the exports which might be made under all Parts of the application.

ECONOMIC CONSIDERATIONS - PARTS 1, 2, 3, AND 4(a) OF THE APPLICATION

The evidence showed that the Point Lepreau nuclear unit was committed for construction to meet anticipated Canadian requirements and with the expectation that only 400 MW of the total capacity would be used to meet electric power demands in New Brunswick. The situation has changed substantially since that time. The entire 630 MW output of Lepreau will be in the form of electricity. The anticipated benefits of installing capital intensive nuclear generation instead of oil-fired generation have been reduced because plant construction costs escalated dramatically while oil price increases in Canada were restrained.

The Applicant's purpose in seeking to arrange unit participation contracts for some of the output of Lepreau was stated to be the reduction of financial exposure. In the event

that the unit experienced operating problems, the heavy fixed costs would still have to be carried but would be shared by those purchasing portions of the unit on a participation basis. Other costs to which NB Power stated it would be exposed are those of replacing energy from Lepreau for use in Canada in case of prolonged outage after the unit is placed in commercial operation.

Naturally, if a portion of Lepreau output is exported when the unit is operating at planned capacity factors, less oil is "backed out" than if the whole of the nuclear plant's output were used at home; NB Power's costs would accordingly rise. Some increases in purchases from Hydro Quebec might also represent a "cost" in the nuclear export case. The exercise becomes one of determining a level of export which allows a goodly portion of Lepreau's generation to remain in New Brunswick to keep oil-fired generation down, but which at the same time provides for a significant portion of carrying charges and costs of reserve to be borne by the participants in the United States.

The evidence shows why, and how, NB Power arrived at the point of negotiating with various United States utilities to sell them power from Point Lepreau on a unit participation basis. By late 1981, when the public hearing on the application was held in Fredericton, NB Power had concluded agreements for Lepreau firm power unit participation sales of 100 MW to MMWEC, 100 MW to BEC and 5 MW to EMEC. It was seeking to negotiate export contracts for an additional 130 MW to bring the total of Lepreau participation power exports to 335 MW applied for under Parts 1, 2, 3, and 4(a) of the application.

The justification for electric power export sales is usually the direct financial profit resulting from the margin of price over cost. In this instance the Applicant has made it clear that the motive is to reduce its financial exposure in Lepreau rather than to gain direct profit. Consequently, in considering whether the price to be charged for the exported power would be just and reasonable in relation to the public interest, the Board has examined the reduction in financial exposure in addition to its customary examination of prices and costs under the "three price tests" described in section 6(2)(z) of the Part VI Regulations

pursuant to the NEB Act. Briefly stated, these price tests are that the export price should recover its appropriate share of the costs incurred in Canada, that it should not be less than the price for equivalent service to Canadian customers, and that it should not result in prices in the export market which are materially less than those which would result from the least-cost alternative.

Under subsection (b) of section 83 of the NEB Act, the Board is required to satisfy itself that the price to be charged for power exported is just and reasonable in relation to the public interest. The Board regards the three price tests as a mechanism for assessing the reasonableness of the export price; however, compliance with the price tests is not a condition precedent to obtaining approval under Part VI of the NEB Act. Under special circumstances the Board may find that the export price is just and reasonable in relation to the public interest, even though the three price tests may not be fully met.

The evidence showed that the revenue which would be received from the export of 335 MW of Lepreau participation power in the year commencing 1 April 1982 would be in excess of $111 million. If Lepreau were to operate at 75 percent capacity factor, this revenue would amount to about 6.2 Cdn. cents/kW.h. Some of the components of this revenue, for example nuclear fuel prices, would be expected to escalate. However, the total of revenues received in future years would be expected to diminish owing to the reduction of charges for cost of money as depreciation accumulates.

The Applicant showed that, under certain expected conditions of system operation, including high Lepreau capacity factor and supply from Hydro-Quebec, there would be an overall saving to NB Power of $54.4 million in the year commencing 1 April 1982 if 335 MW of Lepreau participation power were exported, compared with the case of no export. The saving of $54.4 million would be offset by federal oil compensation payments of up to $5.4 million, resulting in a net margin of revenue over cost incurred in Canada amounting to some $49 million in the first year of Lepreau

operation. The weight of evidence showed that Lepreau is likely to be placed in service close to 1 April 1982. The Board accepts the Applicant's estimates of oil price, oil compensation payments and other expenses and revenues for 1982.

By the eighth year of 335 MW of participation exports from Lepreau, the Applicant estimated there would be a net cost to NB Power of $57.1 million plus federal oil compensation payments of up to $16.5 million for a total net cost in Canada of up to $73.6 million. The forecast swing from a net saving in the early years to a net cost in the later years of the proposed exports depends upon forecasts of oil price and compensation. The Application included a forecast of future imported oil prices and oil compensation payments which increase sharply from 1980 to 1995. The future price of oil appears uncertain. The source of energy for replacement of the nuclear exports is uncertain because of possible future changes to the NB Power system, such as the conversion of Coleson Cove to coal firing or the construction of additional interconnections, and because quantities of hydroelectric energy available from Hydro-Quebec are purchased on an interruptible basis. Thus, the quantity of oil which would be burned in Canada to replace the nuclear power which would be exported is also uncertain.

The Board accepts that the estimates of costs and revenues provided by the Applicant for the later years of the proposed exports were made using the best information available to NB Power. In view of the many uncertainties in forecasting costs and revenues further into the future, the Board in arriving at its disposition has given less credence to the estimates for later years than to the forecasts for the earlier years. Nevertheless,

it seems very likely that the net cost of supplying the participation contracts in the later years will more than offset the gains of the early years, so that there would be a substantial net cost to NB Power and to Canada over the term of the agreements. This net cost can be regarded as the cost of shedding a portion of the financial risk associated with the possibilty of a prolonged outage at Lepreau.

Approval of an application to export a part of the output of Lepreau with its low fuel costs cannot be given lightly, and the Board would be inclined to do so only because of the profound effect a prolonged outage of the plant would have on the financial soundness of the Applicant. Part 3 of the application, however, raises the question of how much of Lepreau's output should be exported weighing the reduction in financial risk against the costs of the reduction.

The Applicant stated that most of the exported energy would be replaced by interruptible energy purchased from Hydro-Quebec. While this energy has been classed as interruptible, experience has established a record of acceptable continuity and reliability of the interconnection; the stated intention to increase the capacity by a new interconnecting transmission link indicates the confidence of the two parties that the supply will continue to be available for some time.

On the other hand, any cheap energy generated by NB Power will be consumed first in supplying domestic base load, and incremental export sales above the 205 MW for which contracts are already concluded would almost certainly result in increased generation from oil or greater Hydro-Quebec energy purchases at prices tied to oil prices, both escalating over the life of the contract. Consequently the apparent costs of replacing energy sold through participation exports would be expected to rise as the quantity increased, particularly in respect of exports proposed under Part 3 of the application.

The Applicant presented evidence to show that the estimated financial exposure reduction due to the sale of 335 MW of Lepreau participation power is some $56.8 million in the year commencing 1 April 1982 rising to $110.5 in the eighth year of the export. These sums represent the net financial impact of a one year outage of the Lepreau station with 335 MW of export participation contracts in effect compared with no participation contracts in effect.

Turning to other matters, several intervenors adduced evidence and made submissions with respect to other costs associated with the Lepreau project.

One area of concern was the interest forgiven on loans from AECL estimated at $102 million. Evidence supplied by the Applicant indicated that this reduction in interest arose as part of a settlement of a claim by NBEPC with respect to defects in the original Lepreau steam generators. Since the extra construction costs incurred in connection with these generators were included in the total cost of the Lepreau plant the Board accepts the omission of this forgiven interest in calculating the price of the export electricity. While the cost of such interest is a cost incurred in Canada, it was incurred in the settlement of a claim for faulty equipment and bears only an indirect relationship to the cost of electricity generated by the Lepreau plant.

Evidence was adduced that NB Power would not levy a separate identifiable charge for wheeling power for MMWEC and BEC from Lepreau to the international border over the 345 kV transmission line. The Applicant stated that it had not included these costs in its agreements because no incremental costs would be incurred in providing this service. If a charge were calculated on a similar basis to that employed under the agreement with MEC for wheeling from Dalhousie Generating Station, the wheeling charge would amount to $8.65/kW year or about 1.5 mills/kW.h at 75 percent capacity factor. There may be some lack of uniform practice on the part of NB Power in charging for wheeling to some customers but not

to others. However, the Board accepts that the expenses in Canada of wheeling to MMWEC and BEC would be very small and that the participation agreements were completed only after prolonged negotiation of all the terms and conditions.

Some intervenors were concerned that there would be some inequality in the billing procedures applied to a Canadian utility which is required to pay NB Power for power on the 15th day of the month whereas an American participation power utility would pay after the end of the month. There was no evidence that any utility which is a customer of NB Power objects to these arrangements. While the date on which payment is required enters into the total cost of electricity purchases, the arrangements made for any particular purchase are matters for negotiation between the parties. In the case of these exports the evidence indicated that the terms of the contract were subject to prolonged negotiation. The Board accepts that the payment terms may differ with individual utilities and between contracts and in this case the terms of payment appear reasonable.

In addition to the above-mentioned costs and billing differentials, several intervenors gave testimony that there would be various additional unspecified costs associated with the operations of NB Power. These included the costs of an environmental study in the Bay of Fundy, a share of nuclear research and development costs on account of the CANDU program and possible charges arising from any type of catastrophic accident that might occur at Lepreau. It appears to the Board that the question here is one of how far the exporter should be required to go in recovering costs which may be far removed from the direct costs of supplying the export contracts and uncertain as to the amount and/or the likelihood and frequency of occurrence The Board finds that these items may properly be regarded as being external to the proposed export contracts. Accordingly it is not necessary that they be specifically recovered in the pricing of proposed exports under this application.

The evidence showed that Hydro-Quebec, Nova Scotia Power Corporation, and MEC had been offered Lepreau power. A nuclear power agreement with MEC had been arranged, terminated and more recently replaced by an agreement involving the Dalhousie unit No. 2. The neighbouring utilities had been offered the blocks of Lepreau participation power proposed for export. Although no responses to these offers were presented, there was no evidence that any Canadian utility had attempted to purchase any of the power proposed for export. The Board noted that none of these parties made any submission at the public hearing.

Witnesses for MMWEC, BEC and EMEC testified that if Lepreau operates at anticipated capacity factors during 1982 the price to the American utilities would be in the range of 5.7-6.9 Cdn. cents/kW.h, including wheeling costs. If Lepreau should operate at lower capacity factors for any reason, the price of energy to the United States utilities would be higher in direct proportion. In subsequent years the price would be expected to drop somewhat because of reduction of the Lepreau cost of capital charges. Witnesses for the United States utilities testified that least cost alternative supplies would be priced at about 5.0-7.3 U.S. cents/kW.h in 1982 with the costs of oil-fired generation expected to be in the region of 10-22 U.S. cents/kW.h by 1990. Evidence was given that the expectation of benefits relative to least cost alternative prices in 1990 was just sufficient to induce MMWEC, BEC and EMEC to accept the risks of paying prices substantially above the least cost alternative in 1982 if Lepreau should falter.

CONCLUSIONS - PARTS 1, 2, 3, AND 4(a) OF THE APPLICATION

As stated in a previous section of this report, the Board is required to satisfy itself that the price to be charged is just and reasonable in relation to the public interest, and in discharging this responsibility the Board customarily examines the proposed export price in relation to its three price tests.

However, under special circumstances, the Board may determine that the requirements of subsection (b) of section 83 of the NEB Act are satisfied even though each of the price tests may not be fully met.

The Board recognizes that the sale of a portion of Lepreau generation in the export market involves costs in Canada over and above those included by NB Power in the price to be charged for the 205 MW sale under Parts 1, 2 and 4(a) of the application. After having assessed these costs in Canada in light of the reduction of financial risk to NB Power, the Board is satisfied that the proposed export price is just and reasonable in relation to the public interest. The Board finds that the proposed exports under Parts 1, 2 and 4(a) are justified in the particular circumstances of the situation in which NB Power finds itself.

Acknowledging that contractual details of any sales beyond the 205 MW were not available at the time of the hearing, the Board was, nevertheless, unconvinced by the evidence before it, that there would not be a disproportionate increase of costs in Canada associated with the sale of an extra portion of Point Lepreau power, i.e., of another 130 MW. The Board was also not convinced that the additional reduction in financial risk associated with a further 130 MW export would warrant the additional cost likely to be incurred by New Brunswick and Canada. Even the need for a further reduction in financial risk beyond that associated with the 205 MW sale was not, in the Board's view, established by the evidence submitted.

The Board would expect that as the time an agreement was signed moved closer to the start-up date or even occurred after start up of Lepreau, the risks of non-performance would decrease and the price realized from the sale should increase correspondingly. Consequently any agreements negotiated at this later date might be expected to command terms more favourable than those contained in the agreements already concluded.

Accordingly, Part 3 of the application for a licence to export 130 MW firm power from Lepreau is denied.

The Board, having had regard to all considerations that appear to it to be relevant, is prepared to issue to NB Power licences under Part VI of the NEB Act:

- To export firm power to MMWEC under Part 1 of the application subject to the terms and conditions set out in Appendix 11;
- To export firm power to BEC under Part 2 of the application subject to the terms and conditions set out in Appendix 12; and
- To export firm power to EMEC under Part 4(a) of the application subject to the terms and conditions set out in Appendix 13.

ECONOMIC CONSIDERATIONS - PART 4 OF THE APPLICATION

Under Part 4 of the application, NB Power seeks a licence to export up to 15 MW of system firm power to EMEC. After Lepreau is placed in service 5 MW of this export would be supplied under the participation contract discussed above.

The price for capacity of $30,000 per MW year appears low relative to market prices. However, the energy charge currently established at 72 mills/kW.h is above present export market prices for energy so that the combined price NB Power would receive for power is above Canadian cost and reasonable relative to United States least-cost alternative supply. No Canadian utilities expressed any interest in this power.

CONCLUSIONS - PART 4 OF THE APPLICATION

Since the energy price may be established from time to time by the Operating Committee, the Board would insert a condition in any licence which it might issue to require NB Power to obtain the approval of the Board for any energy price which the Operating Committee might determine prior to the implementation of the new

charge. With that condition, the Board finds the prices which would be charged for exports under Part 4 of the application to be just and reasonable in relation to the public interest.

The Board, having had regard to all considerations that appear to it to be relevant, is prepared to issue to NB Power a licence under Part VI of the NEB Act to export firm power to EMEC under Part 4 of the application subject to the terms and conditions set out in Appendix 13.

REVOCATION OF LICENCE EL-111

Subject to the approval of the Governor in Council of the new licence authorizing the export of firm power and energy to EMEC, the Board will issue an order revoking the existing licence EL-111.

ECONOMIC CONSIDERATIONS - PART 5 OF THE APPLICATION

Under Part 5, NB Power seeks to amend the existing licence EL-65 to export up to 6 482.4 GW.h of interruptible energy in any twelve-month period from 1 November 1981 to 31 October 1990. The evidence showed that this quantity was equal to the maximum capability of the system to deliver energy over the international power lines. The maximum quantity of interruptible energy that could be exported would be reduced by the amount of firm exports, over the same lines.

The Board is satisfied that these quantities of interruptible energy could become available for export under conditions of high water flow, large supplies from Hydro-Quebec, high capacity factor operation at Point Lepreau and sufficient fossil fuel supply. The Board would reduce the quantities of interruptible energy which may be exported by the amount of firm exports over the 345 kV power line. Thus, it would condition any licence it might issue under Part 5 of the application to reduce the quantity of interruptible energy exported by the amounts of energy exported under Parts 1 and 2 and licence EL-64.

It follows directly from the nature of the pricing formulae, based as they are on incremental cost plus a profit, that the price would meet the first test. A licence condition requiring that the energy be made available to interconnected Canadian utilities on terms no less favourable to them than the terms for the proposed export would ensure that the export price meets the second price test. These interruptible sales are usually made on a split savings basis and are made in competition with United States utilities having similar fuel costs. The Board accepts that the export prices would not be materially less than for similar interruptible sales within the United States. Additionally, the fact that NB Power often buys energy from the United States market, including MPS, is a further indication that NB Power's costs are not materially below the prices prevailing in that market. Thus the price of the interruptible energy that would be exported meets the Board's three price tests.

With the NB Power system presently in operation, the Board finds that the export price to be charged for interruptible energy, based upon the same formulae as in the existing licence, is just and reasonable in relation to the public interest. However, it is possible that future modifications of the system such as the conversion of Coleson Cove to coal-fired or the construction of a second d.c. transmission link with Hydro-Quebec could alter the basis on which the cost of interruptible energy should be determined. If such a situation arose, the Board would rely on its powers under the NEB Act to review any licence it might issue and to re-examine export prices if it deemed this to be necessary.

When energy exported is generated by burning fuel oil, the incremental fuel cost used in the pricing formulae should be, for imported fuel oil, the price paid by NB Power to the importer plus the amount by which that price was reduced by any subsidy or compensation payment. For fuel oil made from domestic crude, the imcremental fuel cost should be the export price of Canadian fuel oil, including any export charge. Any licence issued to NB Power would contain a condition to this effect.

In a modern interconnected utility system, such as the system of NB Power, it may be difficult to identify the source of energy which is exported. However, the Board deems that an export of interruptible energy which occurs at a time when oil-fired thermal plant is operating on the system of the Licensee shall, to the extent of the net output of the oil-fired plant at that time, be priced as if it were an export of energy from the oil-fired plant, except in cases where the oil-fired plant has been started for domestic needs and is kept in service purely for domestic operational reasons. The Board would condition any licence which it might issue for the export of interruptible energy to this effect.

There were no interventions or submissions specifically addressing interruptible energy exports.

CONCLUSIONS - PART 5 OF THE APPLICATION

The Board, having had regard to all considerations that appear to it to be relevant, is prepared to grant this portion of the application. Rather than amending the existing licence EL-65 as requested by the Applicant, the Board believes it would be more expedient to issue a new licence and to revoke the existing licence. While this does not specifically accord with the request of NB Power, the result is the same, and the Board anticipates that the Applicant would not object to this procedure.

Consequently, the Board is prepared to issue to NB Power a licence under Part VI of the NEB Act to export interruptible energy as set out in Part 5 of the application, subject to the terms and conditions outlined in Appendix 14. Subject to Governor in Council approval of this new licence, the Board will issue an order revoking licence EL-65.

ECONOMIC CONSIDERATIONS AND CONCLUSIONS - PART 6 OF THE APPLICATION

Under Part 6, NB Power seeks to have the term of its existing licence EL-66 for firm power as a carrier transfer extended to 31 October 1990 with an increase in the licence quantities to 140 MW and 1 226.4 GW.h in any twelve-month period.

The Applicant stated there would be no changes required to the transmission system to provide this service.

There were no interventions or submissions specifically addressing Part 6 of the application.

Since there would be no incremental costs to offset revenues in supplying this service, the Board's first price test is satisfied. The second and third price tests are not applicable. The Board finds the price to be charged is just and reasonable in relation to the public interest.

Accordingly, the Board, having had regard to all considerations that appear to it to be relevant, is prepared to grant this portion of the application. Rather than amending the existing licence EL-66 as requested by the Applicant, the Board believes it would be more expedient to issue a new licence and to revoke the existing licence. While this does not specifically accord with the request of NB Power, the result is the same, and the Board anticipates that the Applicant would not object to this procedure.

Consequently, the Board is prepared to issue to NB Power a licence under Part VI of the NEB Act to export firm power as a carrier transfer as set out in Part 6 of the application, subject to the terms and conditions outlined in Appendix 15. Subject to Governor in Council approval of this new licence, the Board will issue an order revoking licence EL-66.

ECONOMIC CONSIDERATIONS AND CONCLUSIONS - PARTS 7, 8, 9 AND 10 OF THE APPLICATION

The application under Parts 7, 8, 9, and 10 was for the extension of licences EL-108, EL-109, EL-110, and EL-112, respectively, to 31 October 1990.

Evidence was presented to show that there had not been any changes in the circumstances of the existing licences. No interventions were made in respect of these Parts of the application. Considering the evidence previously given which resulted in the issue of the existing licences, the Board finds that the prices to be charged for exports under Parts 7, 8, 9, and 10 of the application are just and reasonable in relation to the public interest.

The Board, having had regard to all considerations that appear to it to be relevant, is prepared to grant approval to Parts 7, 8, 9, and 10 of the application. Rather than extending the terms of the existing licences, as requested by the Applicant, the Board believes that it would be more appropriate to issue new licences to commence on the expiry dates of the existing licences.

Consequently, the Board is prepared to issue, under Part VI of the NEB Act, licences to NB Power:

- To export short-term firm power to MPS under Part 7 of the application subject to the terms and conditions set out in Appendix 16;
- To export interruptible energy to MPS under Part 8 of the application subject to the terms and conditions set out in Appendix 17;
- To export firm power as a carrier transfer to MPS under Part 9 of the application subject to the terms and conditions set out in Appendix 18; and
- To export interruptible energy to EMEC under Part 10 of the application subject to the terms and conditions set out in Appendix 19.

RECAPITULATION

Having regard to the foregoing considerations, findings and conclusions, and having taken into account all matters that appear to it to be relevant, the Board is prepared to issue nine licences applied for by NB Power under Parts 1, 2, 4, 5, 6, 7, 8, 9, and 10 of this application upon the terms and conditions set out in Appendices 11, 12, 13, 14, 15, 16, 17, 18, and 19 respectively. The application under Part 3 is denied. Subject to the approval of the Governor in Council of new licences, pursuant to Parts 4, 5, and 6 of the application, the Board will issue orders revoking existing licences EL-111, EL-65 and EL-66.

R.F. Brooks,
Presiding Member

J.R. Hardie,
Member

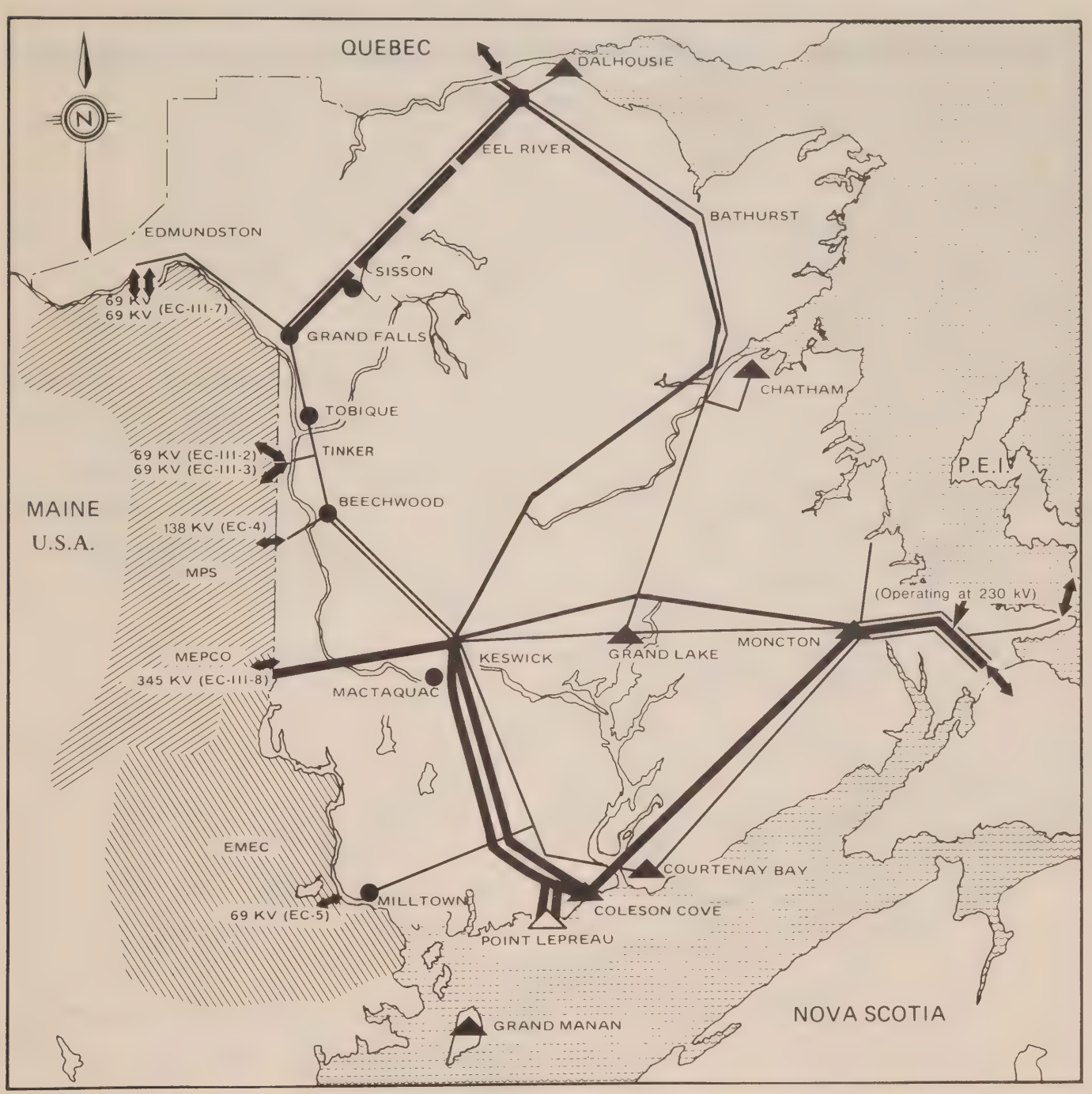
J.L. Trudel,
Member

OTTAWA, CANADA
March 1982

APPENDICES

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION

Major Facilities



GENERATING STATIONS

- HYDRAULIC
- THERMAL
- THERMAL (NUCL.) UNDER CONSTRUCTION

TRANSMISSION LINES

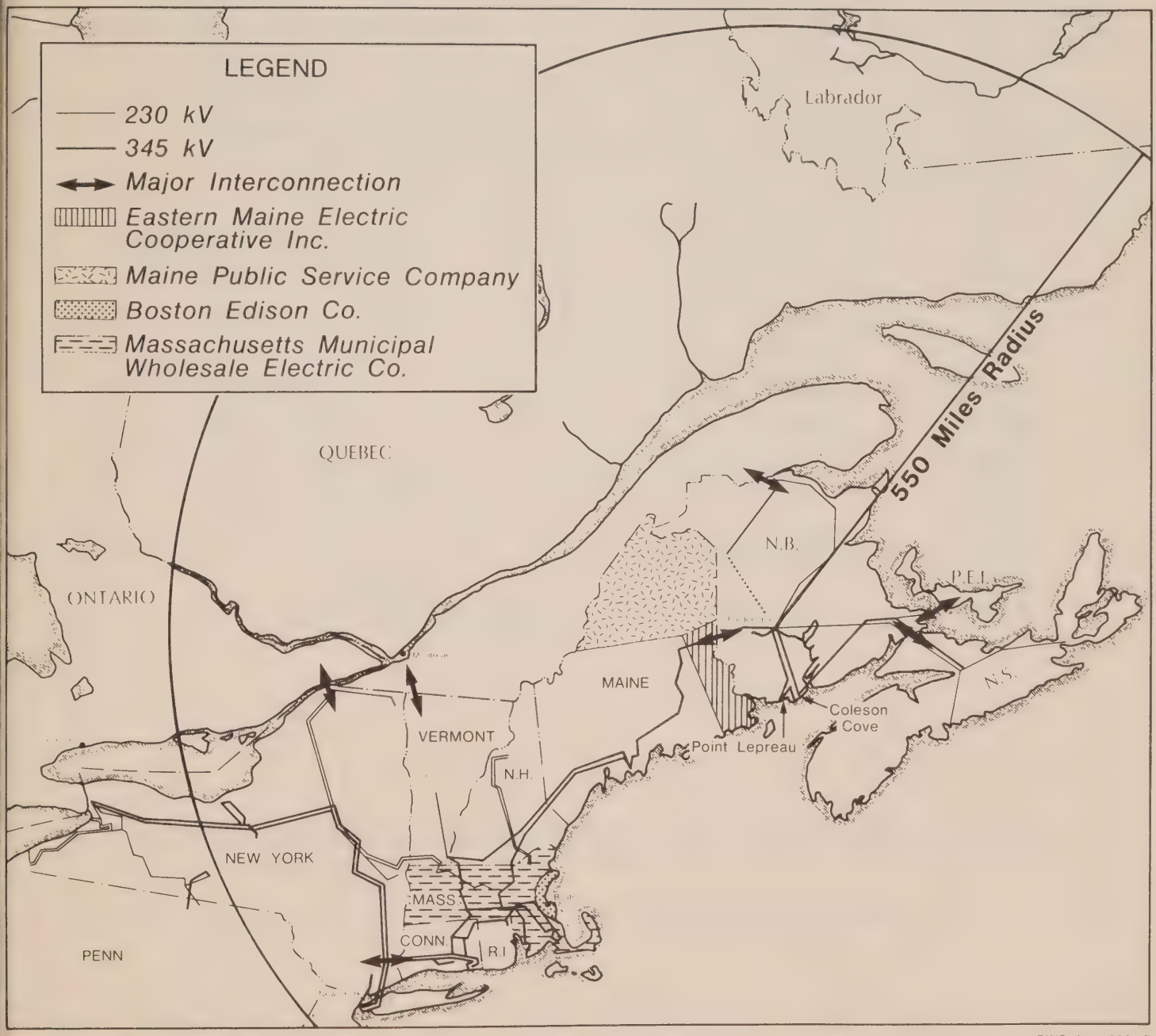
- 345 kV
- 345 kV (OPERATING at 138 kV)
- 230 kV
- 138 kV
- INTERCONNECTION

NATIONAL ENERGY BOARD JAN 1982

DWG NO 1321-E

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION

Major Market Areas



NATIONAL ENERGY BOARD. JAN 1982

DWG No. 1338-E

APPENDIX 3

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION
GENERATING STATION CAPACITIES
(megawatts)

HYDRO ELECTRIC STATIONS	1981	1982-1995
1. Grand Falls	60.0	60.0
2. Beechwood	115.0	115.0
3. Tobique	20.0	20.0
4. Sisson	8.0	8.0
5. Milltown	4.2	4.2
6. Mactaquac	630.0	630.0
Subtotal	837.2	837.2
THERMAL STATIONS		
1. Grand Lake	82.3	82.3
2. Chatham	33.0	33.0
3. Courtenay Bay	261.7	261.7
4. Dalhousie	305.0	305.0
5. Moncton	26.0	26.0
6. Coleson Cove (a)	990.0	990.0
7. Lepreau (Nuclear)(b)	0	630.0
8. Grand Manan	3.8	3.8
Subtotal	1 701.8	2 331.8
Hydro and Thermal Total	2 539.0	3 169.0

(a) The capacity of Coleson Cove as oil-fired plant may change if it is converted to coal-firing.

(b) Lepreau Unit 1 scheduled for service April 1982.

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION
CAPACITY, DEMAND AND SURPLUS
(MEGAWATTS)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Month (a)	APR.	JUNE	APR.	JAN.	JAN.	JAN.	JAN.	JAN.	JAN.	JAN.	JAN.	JAN.	JAN.	JAN.	JAN.	JAN.
Capacity																
1. Hydro	837	837	837	727	727	727	727	727	727	727	727	727	727	727	727	727
2. Thermal	874	1 080	1 367	2 332	2 332	2 332	2 332	2 332	2 332	2 332	2 332	2 332	2 332	2 332	2 332	2 332
3. Purchase (b)	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
4. Total	1 719	1 925	2 212	3 067	3 067	3 067	3 067	3 067	3 067	3 067	3 067	3 067	3 067	3 067	3 067	3 067
Firm Demand																
NB System	1 143	1 034	1 393	1 690	1 754	1 815	1 872	1 930	1 988	2 045	2 102	2 160	2 220	2 281	2 343	2 406
Sale in Canada	0	0	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Export EL-64, EL-111	133	80	153	133	133	133	0	0	0	0	0	0	0	0	0	0
Total	1 276	1 114	1 566	1 843	1 907	1 968	1 892	1 950	2 008	2 065	2 122	2 180	2 240	2 301	2 363	2 426
Reserve & Surplus	443	811	646	1 224	1 160	1 099	1 175	1 117	1 059	1 002	945	887	827	766	704	641
Reserve Required	112	111	160	162	162	161	183	183	182	182	181	234	229	226	225	225
Surplus	331	700	486	1 062	998	938	992	934	877	820	764	653	598	540	479	416

(a) The month shown is the month in which minimum surplus (after firm demand and required reserve) is forecast to occur.
(b) Contractual purchases in the Province.

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION
DEPENDABLE ENERGY SUPPLY LOAD AND SURPLUS
(GIGAWATT HOURS)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Supply																
1. Hydro	1 454	1 454	1 454	1 454	1 454	1 454	1 454	1 454	1 454	1 454	1 454	1 455	1 455	1 455	1 455	1 455
2. Thermal	13 697	14 111	18 542	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534
3. Purchase (a)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Purchase (b)	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
5. Purchase (c)	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
6. Total Supply	15 193	15 607	20 038	20 030	20 030	20 030	20 030	20 030	20 030	20 030	20 030	20 031	20 031	20 031	20 031	20 031
Firm Load																
7. NB System	8 249	8 148	8 955	9 365	9 684	9 989	10 272	10 560	10 840	11 124	11 403	11 695	11 987	12 286	12 587	12 896
8. Interruptible	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9. Sale (d)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. Sale (e)	0	60	150	158	158	158	158	158	158	158	158	158	158	158	158	158
11. Export (f)	2 409	743	786	789	791	643	0	0	0	0	0	0	0	0	0	0
12. Export (g)	0	5	140	0	0	0	0	0	0	0	0	0	0	0	0	0
13. Total Firm Load	10 658	8 956	10 031	10 312	10 633	10 790	10 430	10 718	10 998	11 282	11 561	11 853	12 145	12 444	12 745	13 054
Reserve and Surplus	4 535	6 651	10 007	9 718	9 397	9 240	9 600	9 312	9 032	8 748	8 469	8 178	7 886	7 587	7 286	6 977
Reserve Required	976	976	1 406	1 413	1 413	1 444	1 602	1 599	1 598	1 591	1 667	2 040	1 999	1 976	1 974	2 288
Surplus	3 559	5 676	8 601	8 305	7 984	7 796	7 998	7 713	7 437	7 157	6 802	6 138	5 887	5 611	5 312	4 689

NOTES:
(a) Contractual purchase from Hydro-Québec
(b) Contractual puchase from Natural Resources
(c) Contractual purchase in the Province
(d) Contractual sales to Hydro-Québec
(e) Contractual sales to Maritime Electric Co. (PEI)
(f) Export to MEPCO, EL-64
(g) Export to EMEC, EL-111

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION
MEDIAN ENERGY SUPPLY LOAD AND SURPLUS
(GIGAWATT HOURS)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Supply																
1. Hydro	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**	**2 644**
2. Thermal	**13 697**	**14 111**	**18 542**	**18 534**	**18 534**	**18 534**	**18 534**	**18 534**	**18 534**	**18 534**	**18 534**	**18 534**	**18 534**	**18 534**	**18 534**	**18 534**
3. Purchase (a)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Purchase (b)	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
5. Purchase (c)	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
6. Total Supply	16 383	16 797	21 228	21 220	21 220	21 220	21 220	21 220	21 220	21 220	21 220	21 220	21 220	21 220	21 220	21 220
Firm Load																
7. NB System	8 249	8 148	8 955	9 365	9 684	9 989	10 272	10 560	10 840	11 124	11 403	11 695	11 987	12 286	12 587	12 896
8. Interruptible	1 547	1 506	266	266	266	266	266	266	266	266	266	266	266	266	266	266
9. Sale (d)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. Sale (e)	0	60	150	158	158	158	158	158	158	158	158	158	158	158	158	158
11. Export (f)	2 409	743	786	789	791	643	0	0	0	0	0	0	0	0	0	0
12. Export (g)	0	5	140	0	0	0	0	0	0	0	0	0	0	0	0	0
13. Total Firm Load	12 205	10 462	10 297	10 578	10 899	11 056	10 696	10 984	11 264	11 548	11 827	12 119	12 411	12 710	13 011	13 320
Reserve and Surplus	4 178	6 335	10 931	10 642	10 321	10 164	10 524	10 236	9 956	9 672	9 393	9 101	8 809	8 510	8 209	7 900
Reserve Required	976	976	1 406	1 413	1 413	1 444	1 602	1 599	1 598	1 591	1 667	2 040	1 999	1 976	1 974	2 288
Surplus	3 202	5 359	9 525	9 229	8 908	8 720	8 922	8 637	8 358	8 081	7 726	7 061	6 810	6 534	6 235	5 612

NOTES:
(a) Contractual purchase from Hydro-Québec
(b) Contractual purchase from Natural Resources
(c) Contractual purchase in the Province
(d) Contractual sales to Hydro-Québec
(e) Contractual sales to Maritime Electric Co. (PEI)
(f) Export to MEPCO, EL-64
(g) Export to EMEC, EL-111

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION
MAXIMUM ENERGY SUPPLY LOAD AND SURPLUS
(GIGAWATT HOURS)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Supply																
1. Hydro	4 200	4 200	4 200	4 200	4 200	4 200	4 200	4 200	4 200	4 200	4 200	4 200	4 200	4 200	4 200	4 200
2. Thermal	13 697	14 111	18 542	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534	18 534
3. Purchase (a)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Purchase (b)	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
5. Purchase (c)	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
6. Total Supply	17 939	18 353	22 784	22 776	22 776	22 776	22 776	22 776	22 776	22 776	22 776	22 776	22 776	22 776	22 776	22 776
Firm Load																
7. NB System	8 249	8 148	8 955	9 365	9 684	9 989	10 272	10 560	10 840	11 124	11 403	11 695	11 987	12 286	12 587	12 896
8. Interruptible	1 547	1 506	266	266	266	266	266	266	266	266	266	266	266	266	266	266
9. Sale (d)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. Sale (e)	0	60	150	158	158	158	158	158	158	158	158	158	158	158	158	158
11. Export (f)	2 409	743	786	789	791	643	0	0	0	0	0	0	0	0	0	0
12. Export (g)	0	5	140	0	0	0	0	0	0	0	0	0	0	0	0	0
13. Total Firm Load	12 205	10 462	10 297	10 578	10 899	11 056	10 696	10 984	11 264	11 548	11 827	12 119	12 411	12 710	13 011	13 320
Reserve and Surplus	5 734	7 891	12 487	12 198	11 877	11 720	12 080	11 792	11 512	11 228	10 949	10 654	10 365	10 066	9 765	9 456
Reserve Required	976	976	1 406	1 413	1 413	1 444	1 602	1 599	1 598	1 591	1 667	2 040	1 999	1 976	1 974	2 288
Surplus	4 758	6 915	11 081	10 785	10 464	10 276	10 478	10 193	9 914	9 637	9 282	8 614	8 366	8 090	7 791	7 168

NOTES:
(a) Contractual purchase from Hydro-Québec
(b) Contractual purchase from Natural Resources
(c) Contractual purchase in the Province
(d) Contractual sales to Hydro-Québec
(e) Contractual sales to Maritime Electric Co. (PEI)
(f) Export to MEPCO, EL-64
(g) Export to EMEC, EL-111

SUMMARIES OF AGREEMENTS

This appendix outlines the various agreements relevant to the application which were filed by the Applicant.

POINT LEPREAU UNIT PARTICIPATION AGREEMENT WITH MASSACHUSETTS MUNICIPAL WHOLESALE ELECTRIC COMPANY

The agreement, dated 24 October 1980, between NB Power and MMWEC, defines the terms and conditions under which MMWEC would purchase an entitlement to power and energy from the Point Lepreau generating unit No. 1. MMWEC would be entitled to 16 percent of unit output but not exceeding 100 MW of power and associated energy at the Lepreau station delivered to the point where the international power line crosses the international boundary in or near the Town of Orient, Maine.

The entitlement would commence on the first day of the calendar month following the in-service date. It would expire on 31 October 1987 with three twelve-month extensions at the option of MMWEC, to 31 October 1990.

POINT LEPREAU UNIT PARTICIPATION AGREEMENT WITH BOSTON EDISON COMPANY

The agreement, dated 31 August 1981, between NB Power and BEC, defines the terms and conditions under which BEC would purchase an entitlement to power and energy from the Point Lepreau generating unit No. 1. BEC would be entitled to 16 percent of unit output of power and associated energy at the Lepreau Station delivered to the point where the international power line crosses the international boundary in or near the Town of Orient, Maine.

The entitlement would commence on the first day of the calendar month following the in-service date. It would expire on 31 October 1987 with three twelve-month extensions at the option of BEC, to 31 October 1990, and with additional conditional extensions to 31 October 1995.

POINT LEPREAU UNIT PARTICIPATION AGREEMENT WITH EASTERN MAINE ELECTRIC COOPERATIVE INC.

The agreement, dated 4 August 1981, between NB Power and EMEC, defines the terms and conditions under which EMEC would purchase an entitlement to power and energy from Point Lepreau generating unit No. 1. EMEC could be entitled to 0.8 percent of unit output but not exceeding 5 MW, delivered to the point of attachment of EMEC conductors to the NB Power transmission system at Milltown, New Brunswick. The entitlement would commence on the

first day of the calendar month following the in-service date. It would expire on 31 October 1987 with three twelve-month extensions, at the option of EMEC, to 31 October 1990.

PRICES FOR PARTICIPATION POWER UNDER AGREEMENTS WITH MASSACHUSETTS MUNICIPAL WHOLESALE ELECTRIC COMPANY, BOSTON EDISON COMPANY, AND EASTERN MAINE ELECTRIC COOPERATIVE INC.

It was agreed in the contracts with MMWEC, BEC and EMEC, that American participants would, in general, be billed for the same charges as those applicable to Canadian customers for power from Point Lepreau. Each participant is required to pay NB Power for its entitlement whether or not NB Power generates, produces or delivers the entitlement. Estimated charges to export participants for the month of April 1982, which are summarized in Appendix 4, were calculated according to the Agreements as follows:

Capital Charges

Point Lepreau is assumed to be financed entirely by debt to the extent of the Gross Capital Investment with straight line depreciation over 30 years. Purchasers are billed at a rate of 1.25 interest coverage applied to 90 percent of the outstanding debt applicable to the unit.

Financing for Point Lepreau

NB Power allots portions of debt issues to each of its projects as required. By March 1981 portions of some 38 issues in various currencies to a total of $1.1 billion had been allocated to the Point Lepreau project.

Included in the financing for Point Lepreau was a note dated 28 May 1981 for $350 million payable to AECL. This note is to be repaid in 25 annual installments of principal and interest of $37.7 million.

Gross Capital Investment

The Gross Capital Investment was estimated to amount to $1.215 billion at 1 April 1982. This sum comprises the total costs of Lepreau amounting to $1.335 billion less forecast credits of $35 million for electric power generated prior to the in-service date and $85 million representing a return of interest paid on the $350 million AECL loan on account of equipment replacement.

Heavy Water

Customers charged for carrying cost of heavy water inventory plus a heavy water maintenance charge.

Uranium Fuel

Customers charged for carrying costs on half of the fuel charge plus fuel used.

Operations and Maintenance

Customary charges are levied.

Long Term Waste Management and Decommissioning

Customers to be charged in respect of long term waste management 0.10 cents/kW.h and eventual station decommissioning 0.04 cents/kW.h.

TERMS AND CONDITIONS OF UNIT PARTICIPATION AGREEMENTS WITH MASSACHUSETTS MUNICIPAL WHOLESALE ELECTRIC COMPANY, BOSTON EDISON COMPANY, AND EASTERN MAINE ELECTRIC COOPERATIVE INC.

Special terms and conditions included in the agreements with the American participants include the following:

Limit on Capital Payments

Liability limited to $8M/year.

BEC Bonus Payment

In return for agreeing to pay a bonus referred to in Appendix 5 for receipt of energy exceeding 80 percent capacity factor, BEC was granted an option to extend its contract to 31 October 1995 to the extent of outages at Lepreau exceeding 30 days in the initial contract period. Also, BEC was granted a right of first refusal of 100 MW if NB Power should construct a second nuclear unit at Lepreau.

INTERCONNECTION AGREEMENT WITH EASTERN MAINE ELECTRIC COOPERATIVE INC.

The Interconnection Agreement, dated 4 August 1981, between NB Power and EMEC amends and extends the Interconnection Agreement dated 25 March 1966. The Interconnection Agreement and supplements define the interconnection facilities and transactions and provides schedules of conditions and prices for various classes of power and energy.

The Agreement will commence on 1 November 1981 and may be terminated at any time by mutual agreement of the parties or after 31 October 1990 upon five years notice by either party.

CAPACITY AGREEMENT WITH EASTERN MAINE ELECTRIC COOPERATIVE INC.

The agreement dated 4 August 1981 between NB Power and EMEC defines the terms and conditions under which EMEC will purchase capacity power and energy. The maximum quantity of system firm capacity is 15 MW, 5 MW of this capacity will be supplied under the Point Lepreau Unit Participation Agreement after Lepreau is placed in service.

The Agreement commences 1 November 1981 and expires 31 October 1990.

TRANSMISSION AGREEMENT WITH EASTERN MAINE ELECTRIC COOPERATIVE INC.

The Transmission Agreement dated 4 August 1981 defines the terms and conditions under which power and energy purchased by EMEC under the Interconnection Agreement, the Point Lepreau Unit Participation Agreement and the Capacity Agreement will be delivered by NB Power to the delivery point.

The agreement will expire at the later of the termination of the Capacity Agreement or the termination of the Point Lepreau Unit Participation Agreement.

INTERCONNECTION AGREEMENT WITH MAINE ELECTRIC POWER COMPANY, INC. (PREVIOUSLY WITH CENTRAL MAINE POWER COMPANY)

An Interconnection Agreement dated 31 July 1969, as amended, between Central Maine Power Company and NB Power defines the facilities constructed to connect between Kewick Terminal Station, New Brunswick and a point close to Wiscatt, Maine. The interconnection crosses the international boundary in or near the Town of Orient, Maine. The agreement also defines the classification, terms and conditions of power and energy transactions.

The agreement continues in force for a period of 25 years from July 1969 and may be terminated thereafter upon 24-months notice by either party.

Under an agreement dated 31 July 1969 between CMP and MEPCO this agreement was assigned to MEPCO with the same terms and conditions.

INTERCONNECTION AGREEMENT WITH MAINE PUBLIC SERVICE COMPANY

An Interconnection Agreement dated 4 February 1957, as amended, between MPS and NB Power defines the terms and conditions under which the parties constructed and operate an interconnection which runs from the Beechwood Substation, New Brunswick to a substation near Presque Isle, Maine.

The agreement may be terminated on September first of any year with 24-months notice from either party.

APPENDIX 9

ESTIMATED BILL FOR POINT LEPREAU POWER
MONTH OF APRIL 1982

Total Charges Based on Gross Capital Investment ($1.215 billion)	$17,652,426
Fuel costs:	
- cost of carrying fuel	117,588(1)
- direct fuel costs	870,912
Carrying cost for heavy water	105,527
Operations, Maintenance and indirects	2,155,394
Monthly Cost	$20,901,847

Share of cost to Participants (April 1982)

Participant	Quantity	Canadian Dollars
MMWEC	16% or 100 MW	$ 3,344,295.(2)
BEC	16% or 100 MW	3,344,295.
EMEC	0.8 % or 5 MW	167,215.
NB Power and Others	67.2%	14,046,042.
TOTAL	100%	$20,901,847.

Lepreau Generation (1/12 of full year)

Capacity Factor %	Energy Generation MW.h
100	456 000
80	368 000
75	345 000
65	299 000

Cost of Lepreau Power

Lepreau Capacity Factor %	Cost Cents / kW.h		
	Lepreau Cost	Spent Fuel & Decommissioning	Total
100	4.54	0.14	4.68
80	5.68	0.14	5.82
75	6.06	0.14	6.20
65	6.99	0.14	7.13

(1) Based on 80% capacity factor.

(2) A unit performance charge is applicable, equal to 2% of BEC portion of participation cost for each 1% capacity factor above 80% capacity factor per month to a maximum of 10%.

Numerical Analysis Filed As Evidence By NB Power - Exhibit 81

Numerical Analysis, together with assumptions and information to place the estimate of $50 to $100 million for the net benefit to New Brunswick customers of reducing the risk of a lengthy outage by exporting 335 MW from Point Lepreau in its proper perspective.

EXPLANATION OF METHOD OF ANALYSIS

Basic Approach

The production modelling program "PROSTOR" was used to assess:

a. the cost of generation and power purchases for in-province use; and,

b. the likely net revenues from economy sales to all interconnected markets.

The cases examined herein may be matrixed as follows:

(CASE #'S IN BRACKETS)

	Unit Performance Level Assumed		
	Expected l.f.	62% l.f.	0% l.f.
Existing System			
No Sale	1	2	3
335 MW Sale	4	5	6
Modified System*			
No sale	7	8	9
335 MW sale	10	11	12

*The modified system assumes Coleson Cove conversion to coal and the construction of a second Hydro-Quebec interconnection.

The costs and benefits of the proposed 335 MW sale under various conditions have been assessed by examining the differences between costs for the no sale and 335 MW sale cases.

Key Assumptions

1. 1981 load forecast.

2. September oil price forecast.

3. Interruptible sales and purchases were assumed in all cases.

4. For cases involving Coleson Cove conversion to coal, units 1, 2 and 3 were assumed to be converted by June 1984, April 1985 and January 1986, respectively, Coal prices were assumed to be $87.21/ton in the first year escalating by 11.3% to 1989 and 7% thereafter. These price assumptions are based upon the use of low sulphur coal from Western Canada.

5. For cases involving a second 450 MW tie with Hydro-Quebec, the new facilities were assumed to be installed by October 1985.

6. Nuclear cost and revenue projections are intended to be illustrative only. While they are realistic, they are not based upon any detailed estimates.

Table 1

EXISTING SYSTEM

DIFFERENCES (Impact of 335 MW Sale)

(APRIL 1982 $ MILLIONS)

Existing System	1	2	3	4	5	6	7	8	7 Month Sale 9
A) Cost increases (savings) for NB Power with 335 MW Sale at expected load factors (Case 4 - Case 1)	(54.4)	(19.9)	5.6	21.1	32.6	42.1	48.8	57.1	28.6
B) Cost increases (savings) for NB Power with 335 MW Sale at 62% load factors (Case 5 - Case 2)	(55.8)	(27.2)	(8.0)	3.2	14.2	22.9	29.8	36.3	16.7
C) Cost increases (savings) for NB Power with 335 MW Sale at 0% load factors (Case 6 - Case 3)	(111.2)	(99.8)	(89.6)	(80.6)	(72.5)	(65.4)	(59.0)	(53.4)	(28.2)
D) Exposure to one-year outages with no Sales (Case 3 - Case 1)	117.2	157.8	188.4	201.3	207.1	210.8	212.2	217.9	220.9
E) Exposure to one-year outages with 335 MW Sale (Case 6 - Case 4)	60.4	77.9	93.2	99.6	102.0	103.4	104.4	107.4	164.0
F) Exposure reduction due to 335 MW sale (D - E)	56.8	79.9	95.2	101.7	105.1	107.4	107.8	110.5	56.9

Table 2

Existing System

YEAR 1 (1982/83) FINANCIAL IMPACT OF ONE-YEAR OUTAGE
WITH AND WITHOUT A 335 MW ALL-RISK SALE

(Millions of April 1982 Dollars)

	In-Province Costs*		
	Expected Load Factor	0% Load Factor	Outage Impact
No Export			
Fuel and purchases	128.7	228.6	
Plus nuclear full cost(excl. fuel)	209.1	209.1	
Less nuclear revenues(excl. fuel)	0.0	0.0	
Less margin on economy sales	(23.6)	(6.3)	
Net in-province costs	314.2	431.4	117.2
With 335 MW Export			
Fuel and purchases	173.7	228.6	
Plus nuclear full cost(excl. fuel)	209.1	209.1	
Less nuclear revenues(excl. fuel)	(111.2)	(111.2)	
Less margin on economy sales	(11.8)	(6.3)	
Net in-province costs	259.8	320.2	60.4
Impact of 335 MW Sale	54.4	111.2	56.8

* Existing system

Table 3
Existing System

YEAR 5 (1986/87) FINANCIAL IMPACT OF ONE-YEAR OUTAGE
WITH AND WITHOUT A 335 MW ALL-RISK SALE

(Millions of April 1982 Dollars)

	In-Province Costs*		
	Expected Load Factor	0% Load Factor	Outage Impact
No Export			
Fuel and purchases	170.3	359.4	
Plus nuclear full cost(excl. fuel)	136.4	136.4	
Less nuclear revenues(excl. fuel)	0.0	0.0	
Less margin on economy sales	(27.9)	(9.9)	
Net in-province costs	278.8	485.9	207.1
With 335 MW Export			
Fuel and purchases	261.8	359.4	
Plus nuclear full cost(excl. fuel)	136.4	136.4	
Less nuclear revenues(excl. fuel)	(72.5)	(72.5)	
Less margin on economy sales	(14.3)	(9.9)	
Net in-province costs	311.4	413.4	102.0
Impact of 335 MW Sale	32.6	72.5	105.1

* Existing system

Table 4

COLESON COVE CONVERSION

PLUS SECOND HYDRO- QUEBEC TIE

DIFFERENCES (Impact of 335 MW Sale

(APRIL 1982 $ MILLIONS)

Coleson Cove Conversion & H.Q. 2	1	2	3	4	5	6	7	8	7 Month Sale 9
A) Cost increase (savings) for NB Power with 335 MW Sale at expected load factors (Case 10 - Case 7)	(56.1)	(21.4)	(8.9)	(19.1)	(3.5)	8.4	17.5	27.0	10.1
B) Cost increases (savings) for NB Power with 335 MW Sale at 62% load factors (Case 11 _ Case 8)	(57.5)	(28.1)	(20.0)	(20.8)	(15.0)	(3.7)	5.1	13.4	3.2
C) Cost increases (savings) for NB Power with 335 MW Sale at 0% load factors (Case 12 - Case 9)	(111.2)	(99.8)	(89.6)	(80.6)	(72.5)	(65.4)	(59.0)	(53.4)	(28.2)
D) Exposure to one-year outages with no Sales (Case 9 - Case 7)	116.1	161.0	181.7	163.4	125.2	162.9	170.3	180.7	191.6
E) Exposure to one-year outages with 335 MW Sale (Case 12 - 10)	61.0	82.6	101.0	101.9	83.3	89.2	93.8	100.3	153.3
F) Exposure reduction due to 335 MW Sale (D-E)	55.1	78.4	80.7	61.5	60.4	73.7	76.5	80.4	38.3

TABLE 5

INCREASED OIL CONSUMPTION IN NEW BRUNSWICK DUE TO 335 MW NUCLEAR SALE

(Differences - bbls, 000's)

	1	2	3	4	5	6	7	8	7 month sale 9 *
Existing System									
At expected load factors (Case 4-Case 1)	276	426	553	674	816	1089	1241	1444	423
At 62% load factors (Case 5-Case 2)	260	379	480	575	694	947	1086	1238	413
At 0% load factors (Case 6-Case 3)	0	0	0	0	0	0	0	0	0
Coleson Cove Conversion & Hydro-Quebec #2									
At expected load factors (Case 10-Case 7)	275	401	216	42	29	91	119	160	6
At 62% load factors (Case 11-Case 8)	259	352	187	36	23	74	97	130	5
At 0% load factors (Case 12-Case 9)	0	0	0	0	0	0	0	0	0

Table 6

OIL COMPENSATION COST INCREASES

DUE TO 335 MW SALE

(Millions of April 1982 Dollars)

	1	2	3	4	5	6	7	8	7 Month Sale 9
Existing System									
At expected load factors (Case 4-Case 1)	5.4	7.3	7.3	7.9	9.6	12.6	14.4	16.5	4.8
At 62% load factor (Case 5- Case 2)	5.2	6.4	6.4	6.7	8.2	11.0	12.6	14.2	4.6
At 0% load factor (Case 6- Case 3)	0	0	0	0	0	0	0	0	0
Coleson Cove Conversion & Hydro Quebec 2									
At expected load factors (Case 10-Case 7)	5.4	6.8	2.8	0.5	0.3	1.1	1.4	1.8	0.1
At 62% load factor (Case 11- Case 8)	5.1	6.0	2.4	0.4	0.3	0.9	1.1	1.5	0.1
At 0% load factor (Case 12 - Case 9)	0	0	0	0	0	0	0	0	0

TERMS AND CONDITIONS OF EXPORT LICENCE
PART 1-FIRM POWER AND ENERGY-MASSACHUSETTS MUNICIPAL WHOLESALE ELECTRIC COMPANY

1. The term of this licence shall commence on the date of the approval of this licence by the Governor in Council and shall end on the 31st day of October 1990.

2. The class of inter-utility export transfer authorized hereunder is a sale transfer of firm power and energy.

3. The power and energy to be exported hereunder shall be transmitted over any international power line for which a certificate of public convenience and necessity is in effect.

4. The exports made by the Licensee hereunder shall be in accordance with the Point Lepreau Unit Participation Agreement dated 24 October 1980 between the Licensee and Massachusetts Municipal Wholesale Electric Company.

5. The quantity of power that may be exported hereunder shall not exceed 100 megawatts.

6. As a tolerance, the Licensee may export power at a rate momentarily in excess of that set forth in Condition 5 if such excess is caused by

   (a) electrical short circuit or other uncontrollable circumstances, or

   (b) inability to control precisely the actual rate of transfer.

7. The quantity of energy that may be exported hereunder in any consecutive twelve-month period shall not exceed 876 gigawatthours.

8. The price to be charged by the Licensee for the power and energy to be exported hereunder shall not be less than the price computed in accordance with the Unit Participation Agreement referred to in Condition 4.

9. The Licensee shall not, without the prior approval of the Board, amend, enter into any agreement in substitution for or in addition to, or terminate the Unit Participation Agreement referred to in Condition 4.

10. The Licensee shall inform the Board if it has exercised its option to supply the Lepreau entitlement from alternative sources, pursuant to section 7.1 of the Unit Participation Agreement referred to in Condition 4, in such form and detail as the Board may specify, within 15 days of commencing the alternative supply.

11. The Licensee shall, within 15 days after the end of each month comprised in the term of the licence, file with the Board a report in such form and detail as the Board may specify, setting forth for that month information pertaining to transactions under the licence.

TERMS AND CONDITIONS OF EXPORT LICENCE
PART 2-FIRM POWER AND ENERGY-BOSTON EDISON COMPANY

1. The term of this licence shall commence on the date of the approval of this licence by the Governor in Council and shall end on the 31st day of October 1995.

2. The class of inter-utility export transfer authorized hereunder is a sale transfer of firm power and energy.

3. The power and energy to be exported hereunder shall be transmitted over any international power line for which a certificate of public convenience and necessity is in effect.

4. The exports made by the Licensee hereunder shall be in accordance with the Point Lepreau Unit Participation Agreement dated 31 August 1981 between the Licensee and Boston Edison Company.

5. The quantity of power that may be exported hereunder shall not exceed 100 megawatts.

6. As a tolerance, the Licensee may export power at a rate momentarily in excess of that set forth in Condition 5 if such excess is caused by

   (a) electrical short circuit or other uncontrollable circumstances, or

   (b) inability to control precisely the actual rate of transfer.

7. The quantity of energy that may be exported hereunder in any consecutive twelve-month period shall not exceed 876 gigawatthours.

8. The price to be charged by the Licensee for the power and energy to be exported hereunder shall not be less than the price computed in accordance with the Unit Participation Agreement referred to in Condition 4.

9. The Licensee shall not, without the prior approval of the Board, amend, enter into any agreement in substitution for or in addition to, or terminate the Unit Participation Agreement referred to in Condition 4.

10. The Licensee shall inform the Board if it has exercised its option to supply the Lepreau energy entitlement from alternative sources, pursuant to section 7.1 of the Unit Participation Agreement referred to in Condition 4, in such form and detail as the Board may specify, within 15 days of commencing the alternative supply.

11. The Licensee shall, within 15 days after the end of each month comprised in the term of the licence, file with the Board a report in such form and detail as the Board may specify, setting forth for that month information pertaining to transactions under the licence.

TERMS AND CONDITIONS OF EXPORT LICENCE
PART 4 - FIRM POWER AND ENERGY - EASTERN MAINE ELECTRIC COOPERATIVE INCORPORATED

1. The term of this licence shall commence on the date of the approval of this licence by the Governor in Council and shall end on the 31st day of October 1990.

2. The class of inter-utility export transfer authorized hereunder is a sale transfer of firm power and energy.

3. The power and energy to be exported hereunder shall be transmitted over any international power line for which a certificate of public convenience and necessity is in effect.

4. The exports made by the Licensee hereunder shall be made in accordance with the Unit Participation Agreement, the Capacity Agreement and the Interconnection Agreement, all dated 4 August 1981, between the Licensee and Eastern Maine Electric Cooperative Incorporated.

5. The quantity of power that may be exported hereunder shall not exceed 15 megawatts.

6. As a tolerance, the Licensee may export power at a rate momentarily in excess of that set forth in Condition 5 if such excess is caused by

   (a) electrical short circuit or other uncontrollable circumstances, or

   (b) inability to control precisely the actual rate of transfer.

7. The quantity of energy that may be exported hereunder in any consecutive twelve-month period shall not exceed 92.0 gigawatthours.

8. The price to be charged by the Licensee for power to be exported hereunder from Point Lepreau nuclear generating station shall not be less than the price computed in accordance with the Unit Participation Agreement dated 4 August 1981.

9. The price to be charged by the Licensee for power exported hereunder other than that referred to in Condition 8 shall include a charge for power as defined in the Capacity Agreement plus a charge for energy. The Licensee shall, on or before 1 November of each year throughout the term of this licence, file with the Board a report of the charge for power and energy as of 1 November.

10. The Licensee shall not, without the prior approval of the Board:

    (a) amend, enter into any agreement in substitution for or in addition to or terminate the Unit Participation Agreement, the Capacity Agreement and the Interconnection Agreement referred to in Condition 4, or

    (b) adopt revised prices for energy which may be established by the Administrative Committee under the Capacity Agreement.

11. The Licensee shall inform the Board if it has exercised its option to supply the Lepreau entitlement from alternative sources, pursuant to section 7.1 of the Unit Participation Agreement referred to in Condition 4, in such form and detail as the Board may specify, within 15 days of commencing the alternative supply.

12. The Licensee shall, within 15 days after the end of each month comprised in the term of this licence, file with the Board a report in such form and detail as the Board may specify, setting forth for that month information pertaining to transactions under the licence.

TERMS AND CONDITIONS OF EXPORT LICENCE
PART 5 - INTERRUPTIBLE ENERGY

1. The term of this licence shall commence on the date of the approval of this licence by the Governor in Council and shall end on the 31st day of October 1990.

2. The classes of inter-utility export transfer authorized hereunder are sale, equichange and adjustment transfers of interruptible energy.

3. The energy to be exported hereunder shall be transmitted over any international power line for which a certificate of public convenience and necessity is in effect.

4. The exports of energy made by the Licensee hereunder shall be made in accordance with the Interconnection Agreement dated the 31st day of July 1969, as amended, between the Licensee and Maine Electric Power Company (previously Central Maine Power Company), filed with the Board as part of Exhibit 3 at the hearing of the Licensee's application in October 1969.

5. The quantity of energy that may be exported hereunder shall not exceed 6 482.4 gigawatthours minus the firm energy exported under licence EL-64 and the firm energy that may be exported under licence requests Part 1 and Part 2.

6. The Licensee shall not export energy hereunder

   (a) other than energy which is surplus to the firm energy requirements of economically accessible Canadian markets at the particular time of its exportation, and

   (b) without first offering such energy, including any part thereof, to economically accessible Canadian markets, on terms not less favourable to a Canadian purchaser, after any appropriate adjustments have been made for differences in the cost of delivery, than the terms on which the export would be made.

7. The Licensee shall interrupt or reduce the export of energy hereunder whenever, or to whatever extent, such energy is required by interconnected systems to supply firm loads within Canada.

8. The Licensee shall not, without prior approval of the Board, amend, enter into any agreement in substitution for or in addition to or terminate the Interconnection Agreement referred to in Condition 4.

9. When energy exported hereunder is generated by the burning of fuel oil, the incremental fuel cost used in any pricing formula shall be

   (a) for imported fuel oil, the price paid by the Licensee to the importer, plus the amount by which that price was reduced by any subsidy or compensation payment from any level of government in Canada, and

   (b) for fuel oil made from Canadian crude, the export price of such Canadian fuel oil, including any export charge.

10. Any export, which occurs at a time when oil-fired thermal plant is operating on the system of the Licensee shall, to the extent of the net output of the oil-fired plant at that time, be deemed to be an export of energy from the oil-fired plant, except in cases where the oil-fired plant has been started up for domestic needs and is kept in service purely for domestic operational reasons, or in such other cases as may, upon application, be approved by the Board.

11. The Licensee shall, within 15 days after the end of each month comprised in the term of this licence, file with the Board a report in such form and detail as the Board may specify, setting forth for that month information pertaining to transactions under the licence.

APPENDIX 15

TERMS AND CONDITIONS OF EXPORT LICENCE PART 6-CARRIER TRANSFER FOR MAINE PUBLIC SERVICE COMPANY AND EASTERN MAINE ELECTRIC COOPERATIVE INCORPORATED

1. The term of this licence shall commence on the date of the approval of this licence by the Governor in Council and shall end on the 31st day of October 1990.

2. The class of inter-utility export transfer authorized hereunder is a carrier transfer of firm power and energy wheeled through New Brunswick and exported to the Maine Public Service Company and Eastern Maine Electric Cooperative Incorporated.

3. The power and energy to be exported hereunder shall be transmitted over any international power line for which a certificate of public convenience and necessity is in effect.

4. The quantity of power that may be exported hereunder shall not exceed 140 megawatts.

5. The quantity of energy which may be exported hereunder in any consecutive twelve-month period shall not exceed 1 226.4 gigawatthours.

6. The Licensee shall, within 15 days after the end of each month comprised in the term of this licence, file with the Board a report in such form and detail as the Board may specify, setting forth for that month information pertaining to transactions under the licence.

TERMS AND CONDITION OF EXPORT LICENCE
PART 7-SHORT-TERM FIRM POWER AND ENERGY-MAINE PUBLIC SERVICE COMPANY

1. The term of this licence shall commence on the 1st day of November 1982 and shall end on the 31st day of October 1990.

2. The class of inter-utility export transfer authorized hereunder is a sale transfer of short-term firm power and energy.

3. The power and energy to be exported hereunder shall be transmitted over any international power line for which a certificate of public convenience and necessity is in effect.

4. The quantity of power that may be exported hereunder shall not exceed 20 megawatts.

5. All exports of power and energy made by the Licensee hereunder shall be in accordance with the Interconnection Agreement dated 4 February 1957, as amended between the Licensee and Maine Public Service Company.

6. As a tolerance, the Licensee may export power at a rate momentarily in excess of that set forth in Condition 4 if such excess is caused by

   (a) electrical short circuit or other uncontrollable circumstances, or

   (b) inability to control precisely the rate of transfer.

7. The quantity of energy that may be exported hereunder in any consecutive twelve-month period shall not exceed 140 gigawatthours.

8. The Licensee shall not commit for export hereunder any block of power and energy for a period that exceeds twelve months.

9. The price to be charged by the Licensee for the power and energy to be exported hereunder

   (a) shall be greater than the expected price for interruptible energy in the same period, and

   (b) shall include a demand charge per megawatt of power committed.

10. The Licensee, before committing any block of power and energy for export hereunder,

    (a) shall first offer such power with its associated energy to all economically accessible interconnected Canadian electrical utilities on terms not less favourable to a purchaser, after appropriate adjustment for any difference in the cost of delivery, than those on which the export would be made.

    (b) shall submit the proposed export agreement to the Board for approval, together with

        (i) copies of the offers made to Canadian utilities and of all the replies thereto,

        (ii) an estimate, in such detail as the Board may specify, of the supply, demand and surplus of power and energy on the Licensee's power system for each month of the period covered by the said agreement,

        (iii) a detailed statement of how the price was established, and

        (iv) such other information as the Board may require,

    and

    (c) shall not commence exporting until approval of the agreement is received from the Board.

11. The Licensee shall not, without the prior approval of the Board, amend, enter into any agreement in substitution for or in addition to or terminate, the Interconnection Agreement referred to in Condition 5.

12. The Licensee shall, within 15 days after the end of each month comprised in the term of this licence, file with the Board a report in such form and detail as the Board may specify, setting forth for that month information pertaining to transactions under the licence.

TERMS AND CONDITIONS OF EXPORT LICENCE
PART 8- INTERRUPTIBLE ENERGY-MAINE PUBLIC SERVICE COMPANY

1. The term of this licence shall commence on the 1st day of November 1982 and shall end on the 31st day of October 1990.

2. The classes of inter-utility export transfer authorized hereunder are sale, equichange and adjustment transfers of interruptible energy.

3. The energy to be exported hereunder shall be transmitted over any international power line for which a certificate of public convenience and necessity is in effect.

4. The quantity of energy that may be exported hereunder in any consecutive twelve-month period shall not exceed 300 gigawatthours.

5. All exports of energy made by the Licensee hereunder shall be in accordance with the Interconnection Agreement dated 4 February 1957, as amended between the Licensee and Maine Public Service Company.

6. The Licensee shall not export energy hereunder

   (a) other than energy which is surplus to the firm energy requirements of economically accessible Canadian markets at the particular time of its exportation, and

   (b) without first offering such energy, including any part thereof, to economically accessible Canadian markets, on terms not less favourable to a Canadian purchaser, after any appropriate adjustments have been made for differences in the cost of delivery, than the terms on which the export would be made.

7. The Licensee shall interrupt or reduce the export of energy hereunder whenever, or to whatever extent such energy is required by interconnected systems to supply firm loads within Canada.

8. The prices to be charged for the energy exported hereunder shall be not less than the prices computed in accordance with the Interconnection Agreement referred to in Condition 5.

9. When energy exported hereunder is generated by the burning of fuel oil, the incremental fuel cost used in any pricing formula shall be

   (a) for imported fuel oil, the price paid by the Licensee to the importer, plus the amount by which that price was reduced by any subsidy or compensation payment from any level of government in Canada, and

   (b) for fuel oil made from Canadian crude, the export price of such Canadian fuel oil, including any export charge.

10. Any export which occurs at a time when oil-fired thermal plant is operating on the system of the Licensee shall, to the extent of the net output of the oil-fired plant at that time, be deemed to be an export of energy from an oil-fired plant, except in cases where the oil-fired plant has been started up for domestic needs and is kept in service purely for domestic operational reasons, or in such cases as may, upon application, be approved by the Board.

11. The Licensee shall not, without the prior approval of the Board, amend, enter into any agreement in substitution for or in addition to or terminate the Interconnection Agreement referred to in Condition 5.

12. The Licensee shall, within 15 days after the end of each month comprised in the term of this licence, file with the Board a report in such form and detail as the Board may specify, setting forth for that month information pertaining to transactions under the licence.

APPENDIX 18

TERMS AND CONDITION OF EXPORT LICENCE
PART 9-CARRIER TRANSFER TO MAINE PUBLIC SERVICE COMPANY

1. The term of this licence shall commence on the 1st day of November 1982 and shall end on the 31st day of October 1990.

2. The class of inter-utility export transfer authorized hereunder is a carrier transfer of firm power and energy for wheeling through the United States and simultaneous return to New Brunswick.

3. The power and energy to be exported hereunder shall be transmitted over any international power line for which a certificate of public convenience and necessity is in effect.

4. The quantity of power that may be exported hereunder shall not exceed 50 megawatts.

5. As a tolerance, the Licensee may export power at a rate momentarily in excess of that set forth in Condition 4 if such excess is caused by

   (a) electrical short circuit or other uncontrollable circumstances, or

   (b) inability to control precisely the rate of transfer.

6. The quantity of energy that may be exported hereunder in any consecutive twelve-month period shall not exceed 250 gigawatthours.

7. The Licensee shall, within 15 days after the end of each month comprised in the term of the licence, file with the Board a report in such form and detail as the Board may specify, setting forth for that month information pertaining to transactions under the licence.

TERMS AND CONDITIONS OF EXPORT LICENCE
PART 10-INTERRUPTIBLE ENERGY - EASTERN MAINE
ELECTRIC COOPERATIVE INCORPORATED

1. The term of this licence shall commence on the 1st day of November 1982 and shall end on the 31st day of October 1990.

2. The classes of inter-utility export transfer authorized hereunder are sale, equichange and adjustment transfers of interruptible energy.

3. The energy to be exported hereunder shall be transmitted over any international power line for which a certificate of public convenience and necessity is in effect.

4. The quantity of energy that may be exported hereunder in any consecutive twelve-month period shall not exceed 179 gigawatthours.

5. All exports of energy made by the Licensee hereunder shall be in accordance with the Interconnection Agreement dated 4 August 1981 between the Licensee and Eastern Maine Electric Cooperative Inc.

6. The Licensee shall not export energy hereunder

   (a) other than energy which is surplus to the firm energy requirements of economically accessible Canadian markets at the time of its expropriation, and

   (b) without first offering such energy, including any part thereof, to economically accessible Canadian markets, on terms not less favourable to a Canadian purchaser, after any appropriate adjustments have been made for differences in the cost of delivery, than the terms on which the export would be made.

7. The Licensee shall interrupt or reduce the export of energy to be exported hereunder whenever, or to whatever extent such energy is required by interconnected systems to supply firm loads within Canada.

8. The prices to be charged for the energy exported hereunder shall be not less than the prices computed in accordance with the Interconnection Agreement referred to in Condition 5.

9. When energy exported hereunder is generated by the burning of fuel oil, the incremental fuel cost used in any pricing formula shall be

   (a) for imported fuel oil, the price paid by the Licensee to the importer, plus the amount by which that price was reduced by any subsidy or compensation payment from any level of government in Canada, and

   (b) for fuel oil made from Canadian crude, the export price of such Canadian fuel oil, including any export charge.

10. Any export which occurs at a time when oil-fired thermal plant is operating on the system of the Licensee shall, to the extent of the net output of the oil-fired plant at that time, be deemed to be an export of energy from the oil-fired plant, except in cases where the oil-fired plant has been started up for domestic needs and is kept in service purely for domestic operational reasons, or in such cases as may, upon application, be approved by the Board.

11. The Licensee shall not, without the prior approval of the Board, amend, enter into any agreement in substitution for or in addition to or terminate the Interconnection Agreement referred to in Condition 5.

12. The Licensee shall, within 15 days after the end of each month comprised in the term of this licence, file with the Board a report in such form and detail as the Board may specify, setting forth for that month information pertaining to transactions under the licence.